

No. 11054

IN THE

United States Circuit Court of Appeals

FOR THE NINTH CIRCUIT

INTERNATIONAL CARBONIC ENGINEERING COMPANY,

Appellant,

vs.

NATURAL CARBONIC PRODUCTS, Inc., a corporation,
GEORGE PEPPERDINE FOUNDATION, a corporation, L. H.
POLDERMAN, W. L. BENSON and C. B. BENSON, in-
dividually and as a co-partnership doing business under
the fictitious firm name and style of NATURAL CAR-
BONIC PRODUCTS,

Appellees.

OPENING BRIEF FOR APPELLANT.

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the fictitious firm name and style of NATURAL CAR-
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Appellees.

OPENING BRIEF FOR APPELLANT.

This is an appeal from the final decree of the District Court for the Southern District of California, Central Division, dismissing complaints for infringement of Letters Patent 2,025,698, issued December 24, 1935, for Gas Solidifying Apparatus. The lower court (Judge Jenney) held each of the claims in suit (Nos. 4, 31, 32, 33, 34, 36, 38 and 39) invalid and not infringed [I. 86.]*

*Hereafter the transcript will be referred to by Volume and page number only.

The District Court also dismissed counterclaims of the appellees for violation of the Sherman and Clayton anti-trust acts and for unfair competition. No appeal or cross-appeal has been taken from the decree [I. 86] dismissing said counterclaims.

JURISDICTION.

Jurisdiction to review the decree of the District Court upon this appeal is conferred by §128(a) of the Judicial Code (28 USCA 225). The decree was entered on November 13, 1944 [I. 86]. The notice of appeal was given and filed February 8, 1945 [I. 91]. This is within three months, as allowed by the Act of February 13, 1925, c. 229, §8(c), 43 Stat. 940 (28 USCA 230).

Jurisdiction was conferred upon the court below by §24(7) of the Judicial Code (28 USCA 41) providing that the District Courts of the United States shall have jurisdiction of all actions arising under the patent laws.

STATEMENT OF THE CASE.

The action was originally filed by the appellant and International Carbonic, Inc. against Natural Carbonic Products, Inc. Natural Carbonic Products, Inc., a California corporation, was dissolved, the dissolution becoming effective October 25, 1943, with the appellee, George Pepperdine Foundation, acquiring all of the assets of said corporation, including the alleged infringing apparatus [I. 41]. Subsequent thereto and on February 28, 1944, appellant filed its Further Amended and Supplemental Complaint [I. 21] against all the appellees, the individual appellees being the lessees and operators of the alleged infringing apparatus [I. 27, 41]. All of the appellees except George Pepperdine Foundation filed one answer [I.

26]. The appellee, George Pepperdine Foundation, filed a separate answer [I. 39]. Both answers raised substantially the same issues and the action was tried upon said Further Amended and Supplemental Complaint and said Answers. Subsequent to the entrance of the decree, a motion was made for substitution of party-plaintiff [I. 87] in view of the dissolution of plaintiff below, International Carbonic, Inc. and an order for substitution of appellant as sole plaintiff below was entered January 22, 1945 [I. 90].

Patent in Suit.

The patent in suit [Pltf. Ex. 2, IV. 1317], application filed May 22, 1928, was issued to appellant upon an assignment by the inventors Harry W. Cole and Malcolm W. McLaren made prior to issuance and title was stipulated to by appellees [I. 112].

The invention, as stated in the patent specifications, ll. 1-7, [IV. 1321] relates to improvements in gas solidifying apparatus which is especially designed to make solid blocks of carbon dioxide. Carbon dioxide has peculiar characteristics which complicate the manufacture of solid blocks. It is unstable at atmospheric pressures and can only be maintained in the liquid state at pressures which are above 60.4 pounds per square inch gauge pressure. In converting the carbon dioxide from gas into liquid, pressures exceeding 1000 pounds per square inch are ordinarily encountered. The carbon dioxide when formed into flakes or crystals has the extremely low temperature of -109°F . In addition, it has the further peculiar property of subliming from a solid to a gas without going through the liquid state. The inventors were dealing with a material which had to be carefully handled and

it was necessary to construct an apparatus which would avoid any dangers inherent from the peculiar characteristics. The solid blocks are primarily used commercially for refrigeration and the product is commonly called Dry Ice. A simple efficient apparatus for solidifying carbon dioxide by refrigeration and thereafter compressing the same into dense blocks in the same chamber is disclosed and adequately described in the specifications and drawings. It is necessary in operating any apparatus for solidifying carbon dioxide that liquid carbon dioxide be supplied thereto. A method and apparatus for treating carbon dioxide gas and liquefying the same is disclosed in Fig. 1 of the patent and in the specifications, p. 1, col. 1, ll. 32-55, and p. 1, col. 2, ll. 1-35: Such method or apparatus is not included in the claims in issue and any suitable method and apparatus for liquefying carbon dioxide may be employed without affecting the question of validity or infringement of the claims in issue. Methods and apparatuses for obtaining carbon dioxide gas from various sources and thereafter liquefying the same were admittedly old in the art prior to the invention of the patent in suit.

The Claims in Issue Are Directed to the Vertical Apparatus of Fig. 5.

Fig. 5 discloses a vertical apparatus for solidifying and depositing a mass of solidified carbon dioxide in a chamber and vertically compressing the mass in the same chamber in the location in which the mass is initially deposited therein. The liquid carbon dioxide from a source of supply, such as shown in Fig. 1 of the drawings, is supplied to chamber 100 by means of the inlet 51a. This liquid carbon dioxide, under a pressure of approximately 1200 pounds per square inch in the supplying system, is immediately expanded in the chamber 100 (Specifications p. 1,

col. 2, ll. 47-53). The rapid expansion of the liquid carbon dioxide to a pressure below the so-called "triple point" pressure of 60 pounds per square inch, gauge pressure [I. 183, 184] results in self-evaporative cooling and causes a portion of the carbon dioxide to be frozen out into solid particles or crystals and the remainder of the liquid carbon dioxide to be converted into the gaseous form. Such method of forming solid carbon dioxide by the abrupt expansion of liquid carbon dioxide to a pressure below the triple point pressure is known as the snow method or snowing.

During this period, the chamber 100 of Fig. 5 remains closed to the atmosphere. The gas which remains un-solidified is returned to the system for reliquefaction. This is done by means of an exhaust or return line running from the chamber 100 back into the gas liquefying system, as shown by the line 80, in Fig. 1 of the drawings. After solidification, the solid carbon dioxide which has been deposited by gravity and accumulated as a mass of the desired quantity in the lower part of the chamber 100, is pressed into a solid block by the vertically movable hydraulically operated plunger 103, pressing downwardly to compress the deposited mass of solid carbon dioxide against the lower vertically movable closure head 107, which is also hydraulically operated. After the block has been pressed to the required commercial density, the closure member 107 is lowered so that the chamber is opened and the solid block of carbon dioxide may be removed therefrom. In manufacturing dense blocks of solid carbon dioxide by this method, the source of inlet supply of liquid carbon dioxide through port 51a is shut off when a required supply of solid carbon dioxide has been formed in chamber 100 and prior to pressing. But, the return line 80, remains open for discharge of carbon dioxide gas

from the mass of solid being compressed in the chamber during the pressing operation. Prior to opening the chamber by movement of the closure member 107, after pressing, and subsequent to shutting off the liquid inlet supply, the return line 80 is closed so that air may not be sucked into the liquefying system when closure 107 is open. This would result in admitting air into the carbon dioxide gas liquefying system with resulting dilution which if repeated with each block pressing operation would ultimately result in rendering the liquefying system inoperative. The admission of air into the chamber 100 and from the chamber into the system, would also result in moisture in the air condensing on the cold walls of the chamber and interfering with operation.

The vertically disposed apparatus shown in Fig. 5 of the drawings is adequately claimed in the apparatus claims in suit Nos. 4, 31, 32, 33, 34 and 36, and the method used in operating said apparatus in the manufacture of dense blocks of solid carbon dioxide is adequately claimed in the method claims Nos. 38 and 39. Claim 34, is a typical apparatus claim and includes all the elements necessary for the manufacture of solid blocks of carbon dioxide. Said claim reads as follows:

“In a gas solidifying and pressing apparatus, a vertically disposed closed top and open bottom gas solidifying and pressing chamber, a vertically disposed fluid pressure cylinder below said chamber having a vertically reciprocal plunger therein, a chamber closing head mounted on the upper end of said pressure cylinder and vertically movable therewith between raised position closing the open bottom of the chamber and sealing the chamber from the atmosphere, and lowered position opening the bottom of the chamber, a pressing plunger vertically reciprocal

in said chamber for pressing a mass of solidified gas in the chamber into a block against said bottom closure head when the latter is in raised chamber closing position, fluid pressure means for operating said pressing plunger, means for supplying gas in fluid form to the chamber for expansion to convert a portion thereof to a solid and a portion to a gas when the closure head is in chamber sealing position and the pressing plunger is in raised inactive position in the chamber, means for withdrawing the gas from the chamber during formation of the solid mass, and said closing head upon completion of a block by said pressing plunger being movable downwardly from closing position with the block supported on the head to remove the block from the chamber."

Referring to said claim, it calls for a vertical pressing chamber which is closed at the top, as shown in the drawings, and is opened at the bottom by means of the movable closure member 107. A vertically disposed fluid pressure cylinder 109 is below the chamber with a vertically reciprocal plunger 108 therein and with the closure head 107 mounted on the upper end of the pressure cylinder and vertically movable so as to open and close the bottom of the chamber and to seal the chamber from the atmosphere. In the upper end of the chamber there is a pressing plunger 103 which is vertically reciprocal in the chamber for pressing a deposited mass of solidified carbon dioxide in the chamber after the same has been formed by the admission of liquid carbon dioxide through the port 51a and the expansion of the liquid carbon dioxide in the chamber 100. The pressing plunger 103 is in raised, inactive position in the chamber 100 during solidification of the carbon dioxide and the depositing of a mass of the solidified carbon dioxide in the chamber.

This pressing plunger 103 acts in cooperation with the lower closure member 107 to press the solidified gas into a block. Fluid pressure means, as called for in the claim, provide for operating the pressing plunger 103. The claim also calls for means for supplying gas in liquid form to the chamber 100 for expansion into a solid and a gas when the closure head 107 is in closed position and the pressing plunger 103 is in raised non-pressing position. This means for supplying gas in liquid form is the means shown in Fig. 1 of the drawings and described in the specifications. The claim further calls for means for withdrawing the unsolidified gas from the chamber during formation of the solid carbon dioxide. This is done by means of ports in the chamber 100 and by the return line 80. Thereafter, as called for by the claim, the closure head 107, upon the completion of the pressing operation, is movable downwardly from its closed position and with the solid block supported thereon so that the block may be removed from the chamber 100.

The method claims, for example claim 38 reading as follows:

“The method of producing blocks of solidified gas which includes the steps of, supplying a liquefied gas to a closed chamber that is sealed from the atmosphere and converting a portion of the liquefied gas to a solid and a portion thereof to a gas in the chamber by expansion, maintaining the chamber volume constant while expanding the liquefied gas and accumulating a mass of the solidified gas therein, withdrawing the unsolidified gas from the chamber during formation and accumulation of the solidified gas in the chamber, shutting off the supply of liquefied gas to the chamber to stop production of solid and gas therein after a desired mass of the solid has been

accumulated in the chamber, mechanically applying pressure to the mass of solidified gas in the chamber while the chamber is closed to press the mass into a dense block of solidified gas, and finally opening the chamber to atmosphere and removing the completed block therefrom."

adequately cover the method used in producing blocks of solidified carbon dioxide with the apparatus of Fig. 5.

Fig. 2 of Drawings Not in Issue.

The patent, in Figs. 2 and 3 and in a part of Fig. 1, shows another apparatus for solidifying and compressing carbon dioxide. In this apparatus the solid is formed in the chamber 50 and thereafter with the assistance of the blades or scrapers 59 in the chamber 50 the solidified material falls into the compression chamber 60, which is horizontally disposed. Thereafter the solidified material in the chamber 60 is compressed into blocks by means of hydraulic plungers, one of which is so arranged that it uncovers one end of the compression chamber 60 so that the block may be pushed out of or otherwise removed from the compression chamber. The unused gas, as in the operation of Fig. 5, is returned to the liquefying system and the compression chamber 60 and the chamber 50 in which the gas is solidified remain closed to the atmosphere during the formation of the solid material. It will hereafter be shown that the apparatus of Fig. 5 is the apparatus used by the appellees in the manufacture of blocks of solid carbon dioxide and that the apparatus of Fig. 5 is the only apparatus used for that purpose by the numerous licensees of the appellant. Its use is so extensive that it may readily be said that it is the universal apparatus for the manufacture of blocks of solid carbon

dioxide for commercial purposes. The apparatus of Figs. 2 and 3, therefore, with its horizontally disposed compression chamber and horizontally reciprocal pressing plunger and with a separate chamber above the horizontal compression chamber within which the solid is formed and from which it is fed by rotating blades or scrapers, must not be confused with the vertically disposed apparatus of Fig. 5 wherein the formation of the solid carbon dioxide and the pressing of the solid into dense blocks is accomplished in the one chamber.

The differences in construction and the differences in mechanisms or elements, as well as the difference in the direction of pressing, of the two apparatuses are such that the apparatus of Fig. 5 has come to be the commercially recognized apparatus in this art, while the horizontally disposed apparatus of Figs. 2 and 3 has completely disappeared from the commercial field.

Fig. 5 Capable of Use With All Known Methods of Manufacturing Carbon Dioxide.

The apparatus of Fig. 5 is also capable of producing blocks of solid carbon dioxide by the use of the triple point method of forming solidified carbon dioxide. This triple point method is disclosed and claimed in Slate Patent 1,546,681, No. 15 of Dfts. Ex. EE [IV. 1470]. In the triple point method, liquid carbon dioxide is admitted directly through the inlet 51a into the chamber 100 with the pressure in the chamber being maintained above the triple point pressure of 60.4 pounds per square inch, gauge pressure. At the triple point pressure, carbon dioxide can exist in the form of a gas, a liquid and a solid [I. 184]. Above the triple point pressure the liquid carbon dioxide will remain in the liquid form. After a de-

sired charge or quantity of liquid carbon dioxide has been admitted into and collected in the chamber 100 with the chamber pressure maintained above the triple point pressure, the inlet 51a is closed, and the pressure in the chamber 100 is allowed to fall or drop to the triple point pressure of 60.4 pounds per square inch, gauge pressure. The pressure within the chamber 100 will then remain at the triple point pressure, until all of the liquid carbon dioxide has been converted into solid. This is called the "boil off" period. During the "boiling off" of the liquid carbon dioxide at the triple point pressure, the expansion or evaporation gas is continuously removed from the chamber by the exhaust line 80 and returns to the liquefying system for reliquefaction. After the completion of solidification of that portion of the charge of liquid carbon dioxide frozen out as a solid, the pressure within the chamber 100 drops rapidly to atmospheric or to whatever near atmospheric end pressure is maintained in the chamber 100. This is generally called "the blow down period" [I. 186]. When the pressure in the chamber reaches atmospheric or whatever near atmospheric back pressure is maintained in the chamber during the pressing operation, the deposited and accumulated mass of solid carbon dioxide is then pressed in accordance with the pressing operation heretofore described by the use of the hydraulic plungers. Upon completion of the pressing operation, the block of dense solid carbon dioxide is removed from the chamber 100 in the manner heretofore described by lowering the closure member 107.

The vertical gas solidifying apparatus of Fig. 5 is capable of and has been used to manufacture solid carbon dioxide by use of the above described triple point method of converting liquid carbon dioxide to solid carbon dioxide and also has been used to manufacture solid carbon diox-

ide by expanding liquid carbon dioxide to pressures below the triple point pressure to convert the liquid carbon dioxide into solid particles of snow, and gas. This latter method is the method disclosed in the specifications and heretofore referred to as the "snow" method. Dr. Jones by use of the nine charts comprising Pltf. Ex. 7 [IV. 1331] explained the commercial operations of the licensees of appellant as he had witnessed said operations and in his explanation included both the triple point and snow methods [I. 175-194]. The vertical apparatus of Fig. 5 in addition is capable of use with all known methods of producing solid particles or crystals of carbon dioxide and thereafter pressing the same into blocks of solid carbon dioxide [I. 289].

Prior Commercial Apparatus.

Prior to the invention of the apparatus of Fig. 5, the commercial apparatus for manufacturing solid particles or crystals of carbon dioxide was the snow bank. A photograph showing a snow tank installed for commercial operation is in evidence as Pltf. Ex. 5 [IV. 1329], and a drawing of the same is in evidence as Pltf. Ex. 6 [IV. 1330]. The snow tank is the subject of the United States Patent 1,659,434 issued to J. W. Martin, Dfts. Ex. B [IV. 1359]. In the operation of the snow tank, the liquid carbon dioxide is admitted to a chamber in which the pressure is below the triple point pressure, for example, a pressure of the order of five pounds to the square inch, so that the liquid carbon dioxide immediately abruptly expands into gas with a portion thereof frozen out in the form of particles or flakes of solid carbon dioxide. The unsolidified gas passes up through a filter cloth, shown in Ex. 6, and outwardly through an outlet port into the liquefying system. The snow tank was designed

for low pressure formation of dry powdery snow below the triple point pressure [I. 166]. In operation the formation of the powdered snow continued until the desired charge was accumulated, at which time the liquid inlet was closed [I. 136, 137]. Thereafter the outlet valve was closed and the manhole shown on Pltf. Ex. 6 opened. The mass of solid particles of carbon dioxide was then shoveled manually out of the snow tank and transported to an open mold in the form of a cylinder, open at both ends. The solid carbon dioxide was shoveled into the mold where it was first manually tamped by means of the tamper shown in Pltf. Ex. 6. A charge of the solid carbon dioxide was placed in the mold, and then hand tamped, and additional charges were then placed in the mold and each charge hand tamped until the mold was filled or the desired quantity had been tamped and compressed into the mold for final pressing. The tamper endeavored to distribute the material evenly before pressing and also to try and eliminate any gas or air which might be entrapped between the snow particles. Thereafter more snow was added and the tamping process repeated. The mold was then placed, with its contained compacted mass of solid flakes of carbon dioxide, into position on an open hydraulic press to form blocks of solid carbon dioxide [I. 137]. The press used is diagrammatically shown as a part of Pltf. Ex. 6.

The snow tank was used by Dry Ice Corporation from 1925 to 1933 in nine or ten plants of that concern [I. 143]. One plant alone of the Dry Ice Corporation, which was built at Elizabeth, New Jersey, in 1928 had twelve of the snow tanks in operation [I. 159]. The snow tank served the purpose of getting the industry established in the manufacture of solid carbon dioxide and had the added advantage that the snow tanks had an

initial low cost of construction. However, by 1934 the snow tank was out of existence as a commercial apparatus [I. 161] and is not in use at the present time. The Elizabeth plant, which had twelve snow tanks in operation in 1928 when it was completed, was operated for only four years and was then considered to be obsolete and was replaced with other apparatus [I. 159]. The apparatus that supplanted the snow tank was the vertical apparatus of Fig. 5 and it is significant that within five years of the filing date of the application for the patent in suit ninety percent of the industry was using the vertical closed press of Fig. 5 [I. 168].

The snow tank had numerous disadvantages in commercial operations. The operation of forming solid particles or crystals of carbon dioxide and thereafter pressing the same into solid blocks necessitated an exposure of the mass of particles of solid carbon dioxide to the atmosphere when it was manually shoveled out of the snow tank and transported to the mold. On humid days it resulted in water snow being condensed in the pores of the solid carbon dioxide during handling [I. 152] and the solid carbon dioxide had a particular affinity to moisture in the air [I. 153]. The exposure to the atmosphere and the manual handling resulted also in a loss of the solid material by sublimation which amounted to from 7 to 15 percent [I. 152]. Solid carbon dioxide has the peculiar property of passing directly to a gas without going through the liquid phase. This is called sublimation. The labor costs in forming the solid flakes and thereafter transporting the same to molds, tamping and pressing the same into blocks was approximately Seven Dollars (\$7.00) a ton [I. 158]. This compares to a similar labor cost in the apparatus of Fig. 5 of One Dollar Twenty-five Cents (\$1.25) per ton for accomplishing the same result

[I. 254]. Tamping of the loose mass of solid carbon dioxide which had been shoveled into the mold by a tamp such as shown in Ex. 6 was the universal practice in the operation of the snow tank [I. 152]. This was done because it was the only way possible known at that time to supply the trade with a reasonably uniform and sufficiently dense product to meet the commercial requirements [I. 152]. The density obtained in the block was approximately 1.2 [I. 157]. This compares to the density of the blocks produced by the apparatus of Fig. 5 of 1.5 which approaches the theoretical density of solid carbon dioxide which is 1.56. Care had to be taken in pressing that too much pressure was not exerted, otherwise the block would crack or blow up because of the internal pressure from trapped air, carbon dioxide gas and water snow [I. 157]. The density of the block of the snow tank operation prevented shipments to markets at any great distance and the customary practice in the industry was to sell the product as soon as possible after it had been manufactured [I. 155]. Furthermore, the perfection obtained in tamping varied with the particular man who happened to be tamping the mold and with the condition of the mold, which would produce one result when used warm at the beginning of the day and a quite different result after it had stood in a moist atmosphere so that it might be coated with water ice. This resulted in the density not being constant [I. 156]. The snow tank with these disadvantages was the commercial apparatus in use when the inventors of the patent in suit came into this field.

Cole and McLaren first saw snow tanks in May of 1925 at the General Carbonic plant in Long Island City. The snow tanks were the property of Dry Ice Corporation who remained in that plant from May 1925 to Sep-

tember 1926 pressing and using the liquid carbon dioxide supplied by General Carbonic Company in the operation of the snow tanks [I. 335, III. 1205]. These snow tanks operated in the manner explained by Dr. Jones [I. 336]. Mr. Cole at that time was Manager of Plants for General Carbonic Company [I. 323] and Mr. McLaren was Superintendent of the Long Island plant of that concern [III. 1209]. Snow tanks were operated by Dry Ice Corporation during all this period of time. Cole and McLaren in watching the operations saw the hand tamping, the exposure to the atmosphere, the blowing up of the completed blocks, the waste of gas and all of the other disadvantages previously described [I. 337]. The inventors felt that the snow tank method was uneconomical and that the industry would never grow to any extent using such method and apparatus [I. 336] and, with the disadvantages in mind, they felt impelled to obviate the difficulties [I. 356]. Their first thought was to eliminate all of the difficulties if possible and to get rid of the snow tank, of the transfer of material, of the tamping and of the external pressing in a separate press [I. 373, 374]. They first conceived of the vertical apparatus of Fig. 5, the conception being made in the summer of 1925 [I. 324, 373]. The change to a vertical press, however, wherein the solid material was formed and pressed into blocks in the same chamber, was too radical for the management of the General Carbonic Company [III. 1027]. The result was that the first machine constructed was the horizontal machine of Fig. 2 which was completed in the fall of 1926 [III. 1023]; the conception of this ma-

chine having shortly followed the conception of the vertical apparatus of Fig. 5 [I. 370].

A vertical apparatus, such as shown in Fig. 5, was built in 1928 [I. 340] with the first drawings that were submitted for bids being made in February of that year [I. 370] and the vertical apparatus of Fig. 5 first going into operation in the latter part of November or the first part of December 1928 [I. 370]. Dr. Jones saw the apparatus of Fig. 5 shortly after it was installed for operations and immediately recognized that it was the apparatus he had been looking for, which was a dual machine and that it could operate on the triple point pressure as well as on pressures below that point [I. 369].

Commercial Success.

The vertical apparatus of Fig. 5 went into such extensive use that without modification it has entirely supplanted the snow tank and all horizontal types of apparatus and is now the only commercial machine used in the operation of commercial plants for the production of solid carbon dioxide.

The efficient operation of the apparatus of Fig. 5, whereby a mass of solid carbon dioxide could be formed and pressed into blocks in the same chamber and with the chamber so constructed that no air-moisture or foreign gases would interfere with the obtaining of a dense block of solid carbon dioxide not only resulted in the Dry Ice Corporation discarding the snow tanks and installing the apparatus of Fig. 5 but also resulted in the granting of licenses to a number of prominent concerns to operate

said apparatus. Licenses were granted to Liquid Carbonic Corporation, Pure Carbonic Incorporated, Pittsburgh Plate Glass Company, Mathieson Alkali Company, Michigan Alkali Company (now Wyandotte Chemical Company) and others [I. 344]. These licensees have plants located in various cities. Liquid Carbonic Corporation alone has plants at Long Island City, Boston, Buffalo, New York, Chicago, Pittsburgh, Philadelphia, Seattle, San Francisco, Los Angeles and Albany, New York [I. 347]. All of these plants in the manufacture of solid carbon dioxide blocks use the vertical gas solidifying apparatus which contains the elements of Fig. 5 [I. 349]. The vertical apparatus being used by the licensees is manufactured by a number of concerns, including Frick Company, Hydraulic Press Manufacturing Company and York Ice Machinery Corporation [I. 313]. The vertical apparatus owned by George Pepperdine Foundation and operated by the individual appellees on the property of George Pepperdine Foundation at Niland, Imperial County, California, are Frick and H.P.M. presses manufactured respectively by Frick Company and Hydraulic Press Manufacturing Company.

The vertical apparatus of Fig. 5 not only manufactured dense blocks of solid carbon dioxide in a simple and efficient manner in one chamber but it also eliminated (1) exposure to the atmosphere, (2) high labor costs, (3) loss of material by sublimation and human handling, (4) variations in the density of block structure, (5) tamping, (6) entrapping of air and water snow and (7) wastage of carbon dioxide gas, all of which were the result of the snow tank operation.

Findings of the Court.

Notwithstanding that the vertical apparatus of Fig. 5 completely supplanted the snow tank and became the universal press used by the industry in the manufacture of solid carbon dioxide and overcame the difficulties experienced in the operation of the snow tank and other apparatus used to manufacture solid carbon dioxide into solid blocks, the trial court held that the claims in issue were invalid not only because anticipated by prior art patents but, in addition, because of public prior use, and for lack of invention, aggregation and indefiniteness of the claims. Furthermore, although the appellees operate vertically disposed gas solidifying and pressing apparatus to manufacture solid blocks of carbon dioxide containing all of the elements of the claims in issue, the trial court held that said claims were not infringed. Findings of fact and conclusions of law so holding were signed and filed by the court [I. 71] and the judgment [I. 85] dismissing appellant's complaint was thereafter entered.

Questions on Appeal.

The questions, therefore, involved in this appeal are:

(1) Whether the vertically disposed apparatus of Fig. 5 of the patent in suit, so constructed that solid carbon dioxide flakes can be formed in the chamber of said apparatus and thereafter vertically pressed into blocks of commercial density in said chamber by hydraulically operated rams and not in the presence of the atmosphere and with means to move one of the hydraulic rams to open the chamber and remove the block therefrom, all of which is covered in terms of structure in claim 34 previously quoted herein, constitutes invention;

(2) Whether the claims in issue sufficiently define the invention as required by the provisions of 35 USC 33, R. S. 4888;

(3) Whether the inventors Cole and McLaren were the first inventors of the invention claimed in the claims in issue;

(4) Whether the claims in issue are aggregative in that the elements and steps which relate to the solidification of the carbon dioxide are entirely independent of and are performed independently of the elements and steps of the apparatus for compressing the material, with said elements producing no new function or result;

(5) Whether the appellees have infringed the claims in issue in operating vertically disposed presses in the plant at Niland, California, in manufacturing solid blocks of carbon dioxide.

It is the contention of appellant that there is no evidence to sustain the findings and judgment as to invalidity and that in view of the record there can be no question as to infringement. The numerous errors of the trial court which led it to the conclusions of invalidity and non-infringement are hereafter set forth in detail. It is appellant's position that correctly weighed and properly considered the evidence can only lead to a contrary determination by this court.

SPECIFICATION OF ERRORS.

Appellant relies on the errors specified in the concise statement under Rule 19 [III. 1307-1314]. For the purpose of argument on appeal, we have consolidated and restated these errors in the major points of argument as follows:

(1) Holding the patent in suit, particularly as to each of the claims in issue, to be invalid because anticipated by prior art patents. (Finding 28.), [I. 80];

(2) Holding that the alleged Martin prior use was established by the evidence; failing to hold that, if established, such prior use was experimental and abandoned; and further failing to hold that said use, if established, was not an anticipation of the claims in issue (Findings 18, 19), [I. 75, 76];

(3) Holding that there is no invention in the claims in issue in view of the state of the art (Findings 23, 29), [I. 78, 79, 81];

(4) Holding that appellant's expert witness, Dr. Jones, admitted there was no invention in the claims in issue (Finding 20), [I. 76];

(5) Holding that the claims in issue are indefinite and failed to comply with the provisions of 35 USC §33 (Finding 21), [I. 76];

(6) Holding that the claims in issue constitute aggregation (Finding 24), [I. 79];

(7) Holding that the vertical apparatus of Fig. 5 and the horizontal apparatus of Fig. 2 of the drawings include the same structural elements, have the same mode of operation, have the same function and produce the same result (Finding 16), [I. 74];

(8) Holding that the appellees' vertical machines, the H.P.M. and Frick presses, do not infringe the claims in issue and that said machines have the same elements, employ the same methods and have the same mode of operation as prior art structures (Findings 30, 31), [I. 81, 82].

SUMMARY OF ARGUMENT.

The Claims in Issue Are Not Anticipated.

1. The claims in issue are not anticipated by the patents specified in Finding 28 [I. 80]. Not one of said patents discloses or claims an apparatus or method for producing solid carbon dioxide. All of the structures disclosed in said patents must be changed or modified to manufacture solid blocks of carbon dioxide and to accomplish the function of the vertical apparatus of Fig. 5. The law is clear that prior art patents requiring changes or modifications to accomplish the function performed by the vertical apparatus of Fig. 5, as covered by the claims in issue, are not sufficient to constitute an anticipation. Said prior art patents were not designed nor actually used for the performance of the function of the vertical apparatus of Fig. 5. That such is the law is well stated in the leading case of *Topliff v. Topliff*, 36 L. ed. 658, at 661, 145 US 156.

The Martin Prior Use.

2. The prior use upon which the trial court invalidated the claims in issue is covered by Findings 18 and 19 [I. 75, 76]. It will be hereafter referred to as the Martin prior use. This alleged use occurred in the spring of 1925 and is wholly unsupported by any documentary evidence disclosing the apparatus that was built. The testimony of the three witnesses, Martin, Hood and Eppenbach, supporting said use, is conflicting in many material respects and hazy as to others. Admittedly the building and use of said machine extended only during a period of three

months, during which time numerous changes were made and the machine was frequently inactive because of breakdowns. Although six machines were built, only one was used and it was abandoned in favor of the Martin snow tank and was not used thereafter. The only document produced by appellees in support of said use refers to the machines as experimental. The trial court did not find that said prior use was proven beyond a reasonable doubt. This court in the case of *Carson v. American Smelting & R. Co.*, 4 F. 2d 463, 11 F. 2d 771, stated the necessity for clear and convincing proof of an alleged prior use many years prior to the trial and unsupported by clear and convincing documentary evidence. The trial court has not found that the evidence of prior use is clear and convincing beyond a reasonable doubt but merely that the evidence established the prior use. The failure to so find makes the Findings of no value to this court.

Furthermore, even if this court should find that the Martin prior use was established beyond a reasonable doubt, the prior use structures were not vertically disposed gas solidifying and pressing machines but were horizontal machines and they did not contain the elements of the vertical machine of Fig. 5 and did not function the same.

Said prior use machine, therefore,

- (a) was not established beyond a reasonable doubt;
- (b) was an abandoned experiment;
- (c) did not embody the invention of the vertical apparatus of Fig. 5 as covered by the claims in issue, *e. g.*, claim 34.

**The Vertical Apparatus of Fig. 5, as
Exemplified by the Claims in Issue,
Constitutes Invention.**

3. The claims in issue directed to the vertical apparatus of Fig. 5 disclose for the first time a combination of elements designed for and capable of use for the manufacture of solid carbon dioxide wherein the carbon dioxide is formed and deposited as a mass of solid in the same chamber where the deposited mass of solid is pressed without displacement from deposited location into dense blocks by hydraulically operating pressing rams and with said chamber closed or sealed from the atmosphere so that no air or other foreign substance can interfere with the pressing operations or affect the quality of the dense block.

This combination of elements comprises a simple efficient structure, as so stated in the specifications of said patent, col. 1, l. 3, Pltf.'s Ex. 2 [IV. 1321]. The apparatus of Fig. 5 has supplanted all other machines for manufacturing solid carbon dioxide into blocks. All other machines in the prior art were either structures in which the solid carbon dioxide was formed in one machine and the pressing was done in another pressing apparatus separate from the machine, such as the snow tank operation, or where the solid carbon dioxide was formed in one chamber and the pressing operation took place in an entirely separate chamber of the horizontal type, the solid carbon dioxide being moved or fed from the chamber in which formed to the horizontal type pressing chamber. The simplicity and efficient operation of the vertical operation of Fig. 5 to a large extent resulted in its prompt acceptance by the industry. Notwithstanding this simplicity, none of the prior art structures or patents sug-

gested to the skilled worker in the art that the vertical apparatus of Fig. 5 was the solution to the problem of the industry.

The trial court in Findings 23 and 29 [I. 78, 79, 81], in holding that the claims in issue involved no invention over the prior art, failed to consider the contribution which the vertical apparatus made to the art, and failed to appreciate that the test of invention is not measured by the apparent simplicity of the structure and failed to consider the claims as a combination of elements with the invention residing in the combination. If this court has any question as to invention, the supplanting of all prior art structures, the long continued use of the vertical apparatus by the industry and its commercial success, as evidenced by the prominent licensees and its adoption by the appellees, should resolve all doubts in favor of a finding that the claims in issue involved invention over the prior art.

**Appellant's Expert Made No Admission That
There Was Lack of Invention in
the Claims in Issue.**

4. The Finding 20 [I. 76] that Dr. Jones, appellant's expert, admitted there was nothing new in the combination of elements of the claims in issue is directly contrary to the evidence. The testimony of Dr. Jones upon which said Finding is based was directed solely to the question of what particular structural elements or parts *per se* of the vertical apparatus of Fig. 5 were new. The testimony had no reference whatsoever to the question of whether the new combination of elements of the claims in issue constituted invention. The fact that the witness subsequently stated the invention of the claims in issue clearly shows the court's error.

The Claims Fulfill the Requirements of Title 35 USC §33.

5. The claims in issue and the invention thereof are directed to the persons skilled in the carbon dioxide art. If a person so skilled can construct the apparatus and practice the invention by means of the disclosure of the patent in suit and his knowledge of the prior art, the claims comply with the provisions of §33. All the elements and factors referred to in Finding 21 [I. 76] were well known to the persons skilled in the art prior to the invention of the claims in issue. It would not only have been surplusage to include said elements and factors in the claims but it would have been unnecessarily limiting the invention.

The Claims in Issue Are Not Invalid for Aggregation.

6. The trial court in Finding 24 [I. 79] found that the step of producing solid carbon dioxide in a chamber was entirely independent of the step of pressing the solid carbon dioxide into blocks in the same chamber and, as a conclusion of law therefrom, found the claims in issue invalid for aggregation. The fact that two operations are performed in a single chamber does not constitute aggregation. If they were not performed in the same chamber, the product would be subject to different temperature conditions, to contact with the air with its injurious results and to improper distribution for pressing operations. The formation of the solid carbon dioxide in the same chamber where it is pressed results in the solid carbon dioxide being pressed in the location in which deposited without horizontal displacement or transfer to any other chamber or pressing apparatus. All of these advan-

tages are due solely to the vertical apparatus of Fig. 5 in which the single chamber, the solidifying means and vertical pressing all mutually cooperate to produce the new result in the formation of a uniformly dense block of solid carbon dioxide which can be shipped long distances and without the block cracking or shattering.

The Vertical Apparatus of Fig. 5 Is Not the Same in Structure or Operation as the Horizontal Operation of Fig. 2.

7. The trial court in Finding 16 [I. 74] was undoubtedly influenced by the fact that the drawings of the horizontal structure and the vertical structure appear in the same patent. The fact that the two structures are dissimilar is apparent from the drawings, even though they are used with the same supply system. In the apparatus of Fig. 2 the chamber in which the carbon dioxide is formed, although connected to the pressing chamber, is entirely separate therefrom. It is necessary to use means, such as paddles or scrapers, to force the solid carbon dioxide from the chamber in which it is formed into the pressing chamber. The carbon dioxide falling into the pressing chamber is unevenly distributed therein for the purposes of pressing even though hydraulic rams are used for that purpose.

In the vertical apparatus of Fig. 5 on the other hand there is no necessity for the use of paddles or other means to cause the solid carbon dioxide to be transferred into another chamber. The solid carbon dioxide is pressed into solid dense blocks in the same chamber in which the solid carbon dioxide is formed and in the location in which initially deposited. The difficulties inherent in the horizontal apparatus of Fig. 2 which caused that apparatus to disappear from the commercial market are entirely elimi-

nated in the vertical apparatus of Fig. 5. The differences in structure and operation are such that the vertical apparatus of Fig. 5 is the only one in commercial use at the present time. The Finding of the court is contrary to the disclosure of the patent in suit and is not supported by any evidence.

**The H.P.M. and Frick Presses Operated by
Appellees Infringe Both the Apparatus
and Method Claims in Issue.**

8. The appellees are charged to infringe because of the use of one H.P.M. and two Frick presses at Niland, California. These presses include every structural element in the claims in issue and are operated for the manufacture of solid blocks of carbon dioxide which are thereafter sold in commerce. The appellees seek to escape infringement by contending that the chamber in which the solid carbon dioxide is formed and thereafter pressed into blocks is not sealed or closed from the atmosphere for the reason that gas from the chamber can escape to the atmosphere by means of a pipe after the solid carbon dioxide is formed and prior to pressing. It is significant that there is no contention by appellees that air actually comes into contact with the solid carbon dioxide in the chamber. It is admitted that the outward flow of gas is such as to prevent the admission of air into the chamber. The only reason for exhausting to the atmosphere instead of returning the gas to the system is to save time in the reduction of pressure and it is further significant that there is no exhaust to atmosphere until the pressure in the chamber is approxi-

mately five pounds. The H.P.M. and Frick presses are effectively sealed from the atmosphere in the forming of a solid carbon dioxide and the pressing of the same into blocks in that air does not enter the chamber.

Appellees utilize all of the advantages of the vertical apparatus of Fig. 5, resulting in the manufacture of commercial blocks of solid carbon dioxide. Appellees, using the same combination of elements covered by the claims in issue, for example claim 34, cannot avoid infringement by giving a strained construction to words calling for sealing the chamber from the atmosphere, when no air enters the chamber during any of the forming or pressing operations and the chamber is effectively sealed from the atmosphere by reason of the fact that the escaping gas acts as a seal. It is significant that the size of the opening to the atmosphere and the position of the pipe carrying the exhaust gas is such that admittedly no air enters the chamber. Finding 30 [I. 81] does not support the conclusion of noninfringement. There is no Finding that air or any other foreign substance enters the chamber during any of the operations resulting in the manufacture of the solid blocks of carbon dioxide. The court would put an interpretation upon the word "sealing" which is not imposed by the disclosure of the patent in suit or by any of the proceedings in the Patent Office during the prosecution of the application for said patent.

ARGUMENT.

The Claims in Issue Are Not Anticipated.

The trial court in Finding 28 [I. 80] found that every element and step of the claims in issue, together with the mode of operation described in the patent, is disclosed in the eleven prior art patents particularly specified in said Finding. Not one of these patents is designed for or discloses any structure for the manufacture of blocks of solid carbon dioxide. In fact not one of said patents is designed for or discloses any structure to form solid carbon dioxide. It is significant that, although a number of patents pertaining to the forming of solid carbon dioxide were relied upon by appellees as anticipations, not one of said patents were found to anticipate. A prior art patent does not anticipate if it was not designed for nor used for the performance of the functions of the patent in suit and it is necessary to modify or change the structure disclosed in the prior art patent in order to enable it to accomplish the function performed by the patent in suit. Even though the modification or change be slight, the prior patent cannot be an anticipation. This rule of law is succinctly stated in *Topliff v. Topliff*, 145 US 156, 12 S. Ct. 825, 36 L. ed. 658, at 661:

“While it is possible that the Stringfellow and Surles patent might, by a slight modification, be made to perform the function of equalizing the springs which it was the object of the Augur patent to secure, that was evidently not in the mind of the patentees, and the patent is inoperative for that purpose. Their device evidently approached very near the idea of an equalizer; but this idea did not apparently dawn upon them, nor was there anything in their patent which would have suggested it to a mechanic of ordinary intelligence, unless he were examining it for that pur-

pose. It is not sufficient to constitute an anticipation that the device relied upon might, by modification, be made to accomplish the function performed by the patent in question, if it were not designed by its maker, nor adapted, nor actually used, for the performance of such functions.”

The law of this case has been followed by this court in the case of *Stebler v. Riverside Heights Orange Growers' Assn.*, 205 F. 735, at 738.

Cartier Patent 338,034—Ex. EE-1.

Referring to the patents specified to anticipate in Finding 28, Cartier patent 338,034 (Dfts. Ex. EE-1 [IV. 1422] discloses an oil press. Appellees' expert, Prof. Clapp, admitted [II. 810] that there was no inlet opening shown in the Cartier patent and that without said opening the press would not function for the manufacture of solid blocks of carbon dioxide. He refused to state [II. 812] that the press could be used for the manufacture of solid carbon dioxide, stating that he would have to see the press before he could answer the question. Dr. Jones, appellant's expert, stated in addition [III. 1081] that the Cartier press would not only require an inlet but it would require the reconstruction and closing in of the outlet, of the open oil ducts at the upper edges of the press and the elimination and reconstruction of the perforated irregular surface of the upper and lower pressing surfaces identified by the letter e in the drawings of said patent.

Sailor Patent 467,783—Ex. EE-2.

Sailor patent 467,783 (Dfts. Ex. EE-2) [IV. 1423] discloses a cotton press. Prof. Clapp [II. 813] admitted the necessity for an inlet opening without which the structure would not function to manufacture solid blocks of

carbon dioxide. He also admitted [II. 813, 814] that it would be necessary to do away with the bale grooves which are shown on the pressing platen d of the drawings of said patent and that it would also be necessary to construct the lower pressing piston so that it was properly fitted within the press. Prof. Clapp testified [II. 813] as follows:

“Q. By Mr. L. S. Lyon: Wouldn't it be just as ridiculous to take that cotton press of this Sailor patent and try to make dry ice in it?

“A. Yes, I think it would.”

Dr. Jones [III. 1082] pointed out that the Sailor patent shows no closure head corresponding to the closure head in the vertical apparatus of Fig. 5 and that the other end of the chamber would have to be closed instead of open as shown in the Sailor patent because otherwise the gas outlet might be exposed and air would be drawn into the supply system.

Holden Patents 530,526, 876,352, 1,054,722—

Ex. EE-3,-7,-10.

Holden patents 530,526 (Dfts. Ex. EE-3) [IV. 1426], 876,352 (Dfts. Ex. EE-7) [IV. 1439] and 1,054,772 (Dfts. Ex. EE-10) [IV. 1451], all pertain to a press for condensing ice and thereafter pressing the same into cubes and may be considered together. Prof. Clapp admitted [II. 816] that the chamber D of Holden patent Ex. EE-3 would have to be changed to enable the apparatus to manufacture dry ice and that in addition an inlet opening would have to be provided. He further testified that the apparatus for introducing chip ice into the pressing chamber and floating it through the jacket around said chamber would not be used and that the solidified ice would be open to the atmosphere in the construction shown in said patent

when the valve L of said patent, as shown in the drawings, was open to let the snow fall into the pressing chamber. He further admitted [II. 816] that any inlet pipe would have to extend into communication directly with the chamber D.

Dr. Jones, in addition to the changes specified by Prof. Clapp, pointed out [III. 1082] that no outlet which would be necessary for the exhaust of the carbon dioxide gas is shown and that the Holden patent Ex. EE-3 disclosed a separate snow forming chamber which was without a top and that the scraper members and coils shown in Fig. 1 of the patent would have to be removed if the structure were to be reconstructed for the manufacture of solid blocks of carbon dioxide.

Relative to Holden patents Ex. EE-7 and Ex. EE-10, Prof. Clapp admitted [II. 821] that he would change the proportion of the inlet valves and probably the outlet valves as shown in said patents and that he would substitute the regular inlet with a nozzle and that preferably he would put an inlet at the top of the structure and he would stand the machine on end so as to make it correspond in position to the vertical apparatus of Fig. 5 [II. 822]. He further admitted [II. 823] that in the structure as disclosed if solid blocks of carbon dioxide were formed in the machine that there would be a possibility of the inlet freezing up when the block was formed and if this occurred that any snow that was frozen would have to be blown out of the inlet. Prof. Clapp admitted [II. 825] that he would have to make the same changes in the structure shown in Holden Ex. EE-10.

Dr. Jones, in addition to the changes admitted to be necessary by Prof. Clapp, testified [III. 1084] that the perforated cylinder shown in both of said patents and

surrounding the pressing chamber should be replaced with a solid wall because the passages of the perforated cylinder would tend to be clogged with carbon dioxide and it was questionable as to just what path the outlet gases would take if this clogging took place. He further testified that the bottom inlet, as shown in the structure of the Holden patent, was entirely impractical and would become plugged and it was very questionable whether a second block could be made in the press even though one initial block could be formed.

Drummond Patent 533,871—Ex. EE-4.

Drummond patent 533,871 (Dfts. Ex. EE-4) [IV. 1430] discloses an apparatus for expressing sap or juice from cane. Prof. Clapp admitted [II. 817] that it would be necessary to provide an inlet for said structure for the admission of carbon dioxide. He further admitted that he would take out the perforated pipes which are identified by the letter G in the drawings and he would change the proportions of the machine. To show the impracticability of the Drummond patent as a reference, Prof. Clapp admitted [II. 817]:

“Q. By Mr. L. S. Lyon: In your opinion, you could not take a sugar cane press that had been built in accordance with this Drummond patent and move it into a factory and successfully manufacture dry ice on it without making changes in the machine, is that correct?

“A. That is right.”

Dr. Jones, in addition to the changes admitted by Prof. Clapp, pointed out [III. 1083] that the Drummond patent does not show a closure head for the pressing chamber and that it would be necessary to add an element to perform

the function of closing the top of the chamber. He also pointed out that the perforations designated A and E in the drawings would make it difficult to remove the blocks because the solid carbon dioxide would extrude through the perforations and tend to attach to the platens. In fact the perforations as shown in the patent were of such a size that in pressing there is a probability of the product extruding through the holes in the piston and that the result would be a mass of extruded cylindrical chips instead of solid blocks.

Gaylord Patent 760,191—Ex. EE-6.

Gaylord patent 760,191 (Dfts. Ex. EE-6) [IV. 1434] shows an apparatus for molding articles from amber, preferably pipe stems. Prof. Clapp admitted [II. 818] that it would be necessary to provide an inlet. He further admitted that the only outlet shown in said patent which could be utilized for the withdrawal of gas would be by the withdrawal of the plug 13 of said patent. Prof. Clapp [II. 818] stated:

“Q. Could you manufacture commercial sized blocks of ice as they are shipped in commerce without changing this apparatus?

“A. No.”

He further testified [II. 820]:

“A. I say it should be possible to mold dry ice by making the changes that I have indicated. I do not say you can make it commercially with that sort of a machine.”

Dr. Jones pointed out [III. 1084] that the structure shown in Gaylord patent is an extrusion machine whereby particles of amber are extruded from one chamber into

another through an orifice and that if such a structure were used with solid carbon dioxide it is very doubtful whether a block would result and that, furthermore, Gaylord discloses the cracking or opening of the front block of his molds as a means for venting gases which you can only do at a time when pressure is being exerted on the molds and that it would be impossible to use the block as a vent while at the same time using it as a pressing means.

Osborne Patent 1,104,920—Ex. EE-11.

Osborne patent 1,104,920 (Dfts. Ex. EE-11) [IV. 1463] discloses a machine for making ice whereby water sprayed into a chamber meets countercurrents of air below ireezing, with resultant freezing of the small drops of water into frozen particles. Prof. Clapp admitted [II. 826] that it would be necessary in the reconstruction of this machine for the manufacture of solid carbon dioxide to plug up the holes 13, to take off the spraying device 14 and to substitute a nozzle at 15. He further admitted [II. 827] that there was no provision for the escape of gas from the chamber in which the carbon dioxide would be formed and that the whole bustle pipe 11 would probably fill with carbon dioxide and there would not be an efficient operation. In addition he admitted that he would not retain the air system in the apparatus for circulating air in the structure if he were going to use the structure for the manufacture of carbon dioxide and that it would be necessary after removing said apparatus to connect the outlet 9 to the exhaust end of the carbon dioxide system. Prof. Clapp testified [II. 828]:

“Q. Then, you would substitute a CO₂ compressor system for this air-circulating system as shown in this patent?

“A. Yes. I would not attempt to make carbon dioxide ice out of air, and so—

“Q. As a matter of fact, you would have to dispense with this circulation of air that is described in this Osborne patent in order to make CO₂ blocks practically, would you not?

“A. Yes, sir.”

Stasney Patent 1,288,255—Ex. EE-12.

Stastney patent 1,288,255 (Dfts. Ex. EE-12) [IV. 1467] discloses a process of making soap. The Stastney patent shows the use of compressed air in operating the pressing platen shown therein. Prof. Clapp testified [II. 836]:

“Q. What would happen in a CO₂ manufacture if you tried to use compressed air in the manner shown in this Stastney (1464) patent?

“A. It would not be very effective.

“Q. What would be the matter with it?

“A. Well, if it leaked beyond the rings of the piston at all, it would blow up through the compressed ice and that would not be good.”

He further testified that in using air, as shown in the Stastney patent, to operate the pressing plunger that moisture would condense on the wall on the inside of the chamber and would freeze.

“Q. This patent does not show any way of getting the (1467) piston down so as to start another block, does it, after you have made one block?

“A. No.” [II. 838.]

Prof. Clapp further admitted [II. 829] that it would be necessary to change the size of the inlet and [II. 828] that it would be necessary to change the construction to prevent the top blowing off of the structure because of the higher pressures used in the manufacture of solid

carbon dioxide. In addition Prof. Clapp admitted [II. 833] that the type of valve shown in the Stastney patent, designated by 10, was a plug valve and that it would not be practical to use it in the manufacture of solid carbon dioxide because it would probably freeze up. He also admitted [II. 835] that it would be necessary to make some change in the outlet by changing the size of the gas outlet with reference to the inlet pipe inasmuch as the Stastney patent shows the gas outlet which is only a fraction of the area of the inlet. Dr. Jones, in addition to the changes which Prof. Clapp admitted were necessary, pointed out [III. 1088, 1089] that the Stastney patent showed a square soap molding structure which described packing rings 15 for forming a tight fit between the wall 6 of the mold and the pressing apparatus 14. This would result in a sticking of the pressing cylinder within the chamber because of the freezing of the packing material to the walls if the structure were reconstructed for the manufacture of solid carbon dioxide.

Dr. Jones further pointed out that the position of the vent 20 to the air in the top center of the chamber made it completely inoperative as a vent to air when commercial density was desired in that a charge of solid carbon dioxide in the chamber when pressed by the piston against the solid block at the top of the chamber would close the opening and the greater the effort to produce a dense product the more tightly it would seal the vent to the atmosphere and prevent a commercial product being produced. That such would be the result was shown by the operation of a structure built with the changes admitted by Prof. Clapp and operated before the court and which is in evidence as Dfts. Ex. II. When operated the vent to the atmosphere was sealed off with the result that there was only a small block of carbon dioxide left in the chamber after the

pressing operation and that there was a violent fluctuation of the pressure gage which eventually resulted in it being broken. Dr. Jones testified [III. 1089]:

“* * * However, I do not believe that it can be operated at all to produce solid carbon dioxide of commercial density, and I believe the defendants have proven that point by their demonstration.”

In giving this testimony Dr. Jones was referring to the fact that the pressing operation must be stopped before the block reaches a density where it will prevent the escape of gas through the vent 20 [III. 1091]. The Stastney patent, chosen by Prof. Clapp as the best example of a prior art structure for making solid carbon dioxide, even with the changes made in the model exhibited before the court, did not produce satisfactory blocks of solid carbon dioxide and the court after an examination of the block produced by the Stastney model stated [II. 720]:

“Mr. Foster: Did the court sufficiently observe the degree of hardness of the block that was made?”

“The Court: I noticed that when plaintiffs’ expert pinched it at the side, that at that time it seemed to give way rather readily. Has it hardened somewhat since?”

“Mr. Foster: No, it is the same degree. * * *”

It is significant that a model of the admittedly closest prior art structure even with the changes which were necessarily made in the same in order that it would function to manufacture solid blocks of carbon dioxide did not manufacture blocks which would have the required density for commercial purposes.

Kochenderfer Patent 1,631,037—Ex. EE-17.

The patent to Kochenderfer 1,631,037 (Dfts. Ex. EE-17) [III. 1477] discloses a hydraulic press for dehydrating boiled garbage or other products of a pulpy nature containing liquid. Prof. Clapp on direct examination [II. 738] admitted that this was a rather formidable looking machine. In addition he admitted [II. 845,846]:

“Q. In your opinion, if the device was built for the purpose of operating on dry garbage, (boiled) could you take that device into a plant and use it practically for the manufacture of dry ice blocks without making any change in the device?

“A. No.”

The changes which Prof. Clapp would make in the structure would be to change the inlet and place it above the downward position of the ram 3 as shown in Fig. 7 [II. 846]. The witness also admitted [II. 848] that he wouldn't use the common piping system both as an inlet and outlet if he was trying to make carbon dioxide blocks in the Kochenderfer structure. He further admitted [II. 847] that it would not be practical to feed liquid carbon dioxide into the apparatus in the arrangement as shown in the Kochenderfer patent because it would be open to the atmosphere. Dr. Jones testified [III. 1092] that it would be necessary to remove the perforated piston heads with the drainage plates 5 thereon and replace these elements with the solid compression members shown in the patent in suit to prevent the extrusion of solid carbon dioxide through the perforations, with the same result as Dr. Jones testified to in connection with Drummond patent Ex. EE-4.

Voightlander Patent 1,726,373—Ex. EE-22.

Voightlander patent 1,726,373 (Dfts. Ex. EE-22) [IV. 1516] is an apparatus for quickly extracting liquid and moisture from laundered articles. Prof. Clapp admitted [III. 872] that the perforated platens of the pressing members would probably clog up with snow [III. 873] and that the structure was not designed to withstand pressures which would be encountered in the manufacture of solid carbon dioxide [III. 874]:

“Q. And a device of this kind, built for removing moisture from laundry, would not be built to withstand gas pressures of, say, a thousand pounds; you agree to that, do you not?

“A. Yes; I think that is true.”

Prof. Clapp also testified [III. 872] that the compressed air line 46 would be used for the inlet of carbon dioxide gas and that said inlet should be below the upper plunger 18 and that he would use the vacuum line 45 as an outlet and either eliminate the drain pipe 43 or close it off. The air line 46 and the vacuum line 45, as shown in the Voightlander patent, function to permit compressed air to flow through the laundered mass and to be drawn out by means of the vacuum line, thus removing moisture and drying the articles and for that purpose the compressed air may be heated. The pipe 42 functions to drain the moisture from the bottom of the container. Dr. Jones [III. 1095] stated that it would be necessary to discard both the upper and lower plungers and replace them with solid plungers because of the extrusion of solid carbon dioxide through the openings shown in the Voightlander patent.

Finding 28, that the above patents include every element and step of the claims in issue and have the same mode of operation as the patent in suit, is shown to be clearly in error by the testimony of appellees' expert, Prof. Clapp. This witness admitted that each and every one of the structures shown in said patents required changes in order that they would function to manufacture solid blocks of carbon dioxide. Dr. Jones pointed out additional necessary changes. The evidence not only fails to support said Finding but would support a Finding that said patents are not anticipations. This court in *Los Alamitos Sugar Co. v. Carroll*, 173 F. 280, at 285, in sustaining the patent there before the court, said:

"It is not sufficient to constitute anticipation that the devices relied upon might, by a process of modification, reorganization, or combination with each other, be made to accomplish the function performed by the device of the patent sued on. (Citing cases, including *Topliff v. Topliff*, *supra*.)"

The patents specified in Finding 28 all require modification, change or reorganization. By the language of this court, they are not anticipations.

The Martin Prior Use.

**The Martin Prior Use Has Not Been Established
Beyond a Reasonable Doubt.**

The lower court in Findings of Fact 18 and 19 [I. 75, 76] found that the evidence established the Martin prior use in the spring of 1925. The evidence establishing said use was the testimony of J. W. Martin, his long time friend Walter Lee Hood, and Edwin Eppenbach. Neither the alleged prior use machine, nor any part or parts thereof, was produced. No documentary evidence was produced

which described or disclosed the prior use machines. The only documentary evidence used to support the oral testimony was the records of Eppenbach, Incorporated (Dfts. Ex. VV) [IV, 1377-1389a], and said records do not contain any description of the Martin machines. Sketches of the machines, made by Martin in May, 1944, immediately prior to trial, are in evidence as defendants' Exhibits L [IV. 1373], O [IV. 1376] and P [IV. 1377]. The Supreme Court of the United States early pointed out the necessity for convincing evidence in establishing a prior use. In *Coffin v. Ogden*, 21 L. ed. 821, at 823, 85 US 120, the court stated:

“The invention or discovery relied upon as a defense, must have been complete, and capable of producing the result sought to be accomplished; and this must be shown by the defendant. The burden of proof rests upon him, and every reasonable doubt should be resolved against him. If the thing were embryotic or inchoate; if it rested in speculation or experiment; if the process pursued for its development had failed to reach the point of consummation, it cannot avail to defeat a patent founded upon a discovery or invention which was completed; while in the other case there was only progress, however near that progress may have approximated to the end in view. The law requires, not conjecture but certainty. If the question relate to a machine, as thus exhibited, the conception must have been clothed in substantial forms which demonstrate at once its practical efficacy and utility.”

This rule of law is particularly applicable where the prior use is supported by oral testimony of witnesses endeavoring to remember events occurring many years ago. The Martin prior use was admittedly approximately twenty

years ago. The Supreme Court in *Eibel Process Co. v. Minnesota & Ontario Paper Co.*, 67 L. ed. 523, at 531, 261 US 45, commented on such evidence as follows:

“The oral evidence on this point falls far short of being enough to overcome the presumption of novelty from the granting of the patent. The temptation to remember in such cases, and the ease with which honest witnesses can convince themselves, after many years, of having had a conception at the basis of a valuable patent, are well known in this branch of law, and have properly led to a rule that evidence to prove prior discovery must be clear and satisfactory. Barbed Wire Patent (*Washburn & M. Mfg. Co. v. Beat Em All Barbed Wire Co.*), 143 U. S. 275, 284, 36 L. ed. 154, 158, 12 Sup. Ct. Rep. 443, 450; *Webster Loom Co. v. Higgins*, 105 U. S. 580, 591, 26 L. ed. 1177, 1181.”

In *Carson v. American Smelting & Refining Co.*, 11 F. 2d 766, at 771, this court reiterated this rule of law, stating:

“It is well settled that the oral testimony of many witnesses, if unsupported by any evidence consisting of documents or things, must be very reasonable or very strong to establish the defense of prior use.”

The trial court did not find in Findings 18 and 19 that the prior use was established beyond a reasonable doubt as laid down in *Coffin v. Ogden*, *supra*. The court merely found that the evidence established the prior use. The Findings are of no assistance to this court upon the question of whether the Martin prior use was established in law and beyond a reasonable doubt. The trial court was fully familiar with this rule of law, as evidenced by discussions in the court room during the progress of the trial,

and his failure to make Findings that the use was established beyond a reasonable doubt is significant, particularly in view of the nature of the evidence.

J. W. Martin and Walter Lee Hood, who testified to the prior use referred to in Findings 18 and 19, entered the employ of Dry Ice Corporation in January, 1925, and April 10, 1925, respectively. At that time Dry Ice Corporation leased space in the plant of Liquid Carbonic Corporation in Maspeth, Long Island [II. 538]. The Martin prior use admittedly covered only a period from the latter part of March, 1925, to about the middle of June, 1925, a period not exceeding three months [II. 538, 550]. The use consisted of the operation of a single machine [II. 592, III. 983]. Martin and Hood testified that this machine as first installed consisted of a cylindrical tank set over a cone shaped hopper, the hopper being connected to a chamber of a horizontal press. In operation the liquid carbon dioxide was fed into the tank and snow formed therein. The snow was thereafter transferred through the hopper and into the pressing chamber. This press consisted of a chamber into which the snow fell from the hopper and a plunger or pressing head which compressed the snow in the chamber [II. 527]. Difficulty was encountered with this structure because the solid carbon dioxide would not fall into the pressing chamber due to the tendency of the snow to stick to the sides of the cylindrical tank [I. 541, III. 922]. The result was that a change was made after the machine had been in operation only a short period of time. Hood testified [III. 921] that a change was made in this structure within two or three days after he entered the employ of Dry Ice Corporation, *i. e.*, April 10, 1925. Martin testified [II. 545] that this change occurred early in April, 1925, and consisted in the removal of the cylindrical tank with the

carbon dioxide being fed into the side of the hopper. By the latter part of April or the first of May, another change was made [II. 545] which consisted in taking off the conical hopper and inserting a spool piece or adapter above the pressing chamber in which the carbon dioxide inlet was placed [II. 542, 543]. Within a short period of time, another change occurred which consisted in placing a pyramidal shaped screen in the top of the adapter because the screen previously used tended to burst from the snow pressure built up from the clogging up of the screen [II. 543, 545]. At the time of this last change, which was some time in May of 1925 [II. 578], the carbon dioxide inlet was placed in the pressing chamber. Although Martin and Hood are not definite as to the times of operation of the various changed machines, nevertheless they agree that the operations took place during the months of March, April and May and may have extended over into June and were definitely over before July 4, 1925 [II. 578, III. 928, 929]. It is admitted that the use of the machines, even as changed, was discontinued in June, 1925 [II. 593, III. 929].

Snow tanks heretofore described (page 12) and the subject of Martin patent 1,659,434 (Dfts. Ex. EE-20) [IV. 1501] were used for the production of solid blocks of carbon dioxide beginning in June, 1925 [II. 554] and three snow tanks were constructed to fill the demand [II. 555]. The replacement of the Martin prior use machine, with its various changes, by the snow tank with its separate forming of the snow, tamping operation and pressing operation [II. 551] was in the face of a demand for dry ice which could not be supplied by Dry Ice Corporation. Hood testified [III. 929]:

“A. I don't think there was any time, except possibly in the depth of winter, that we weren't behind

in our sales. Rationing started in those days with us, because we had to ration it to customers.”

This demand for dry ice was prior to July Fourth and Dry Ice Corporation was unable to supply the demand at any time during the first year of operation [III. 978]. This demand continued throughout the year 1926 [III. 981]. The witnesses endeavored to explain the adoption of the snow tanks and the discontinuance of the Martin prior use machine upon the ground that it would cost considerable money to build a Martin prior use machine of sufficient size to supply the demand. This, however, is in the face of the fact that within the period of two years a new plant was built by Dry Ice Corporation at Elizabeth, New Jersey, at a cost admittedly of \$300,000 and probably approaching \$600,000 [II. 593].

The witness Martin also testified that there were two additional machines built corresponding to the machine shown on the sketch Ex. O [IV. 1376, II. 592] which were available for use [II. 596] but which were never used regardless of the demand for dry ice. The witness Hood testified that there was only one additional machine that he could remember, that there was space to install the same but that it was never installed [III. 974]. The witness Eppenbach, who testified to the manufacture of machines, stated [III. 1256] that six machines were built. After reflection and hearing the testimony of Eppenbach, taken by deposition in New York, Martin remembered that three additional machines were made [III. 1301] but he had no recollection of seeing these machines at the Maspeth plant of Liquid Carbonic Corporation [III. 1301].

It does not appear logical, if these Martin prior use machines were available for use at a time when the demand

for dry ice was such that the customers could not be supplied, that Martin would devise and invent the snow tank for the production of dry ice and substitute the same for the Martin prior use machine if the Martin prior use machine was a satisfactory commercial machine and had operated to produce blocks of solid carbon dioxide which were of commercial quality. An examination of the evidence shows that the machines were not satisfactory in operation and that the product was not commercially satisfactory. Admittedly the difficulty of getting the snow into the pressing cylinder caused a change in the Martin machine [III. 922]. Admittedly a further change was necessitated in removing the hopper and substituting an adapter for the screen on top [II. 542]. This change was necessitated by the fact that in operation the snow would not go down through the hopper into the pressing chamber and otherwise they would not have changed the construction [III. 967]. Admittedly an additional change was made in inserting a pyramidal shaped screen in the adapter because of the freezing up of the same [II. 545]. In addition to these admitted changes due to the failure of the machine to function in the desired manner, Hood testified [III. 925]:

“A. Oh, yes, we had trouble with it all the way through. We produced with it, but we had mechanical troubles, as you do with most new machines, I think.”

Hood further testified [III. 963]:

“Q. Did you ever have any difficulty in the motor jamming so that it would not go past center because you had too much snow in there?

“A. Yes, sir [1641].

“Q. You had quite a bit of difficulty, didn't you?

“A. Yes, sir.”

and he further testified [III. 964]:

“Q. So the troubles you are talking about are the troubles you had in operating the machine, is that correct?”

“A. Yes, sir.

“Q. Did you have any trouble with the freezing up of the nozzles or freezing up of the outlets?”

“A. I think perhaps we did; yes.”

The witness Martin testified [II. 581] that the operations of the Martin prior use machine were:

“A. It was crude, preliminary operations.”

and he further testified [II. 602] relative to the operation of the pressing plungers:

“* * * The nearest it would operate was by allowing it to withdraw to the position shown here, and not driving it against pressure. It was almost impossible to drive it in the later stages of this development.”

The development referred to was the last change made in the Martin prior use machine just before the entire machine was abandoned and never used again. We, therefore, have not only numerous changes in the machine as first constructed but continuous troubles during every change. It would appear more logical as a reason for discontinuing the Martin prior use machine that the difficulty of operation was the controlling factor rather than the cost of constructing additional machines.

Relative to the quality of the blocks produced by the Martin prior use machine, Hood testified [III. 966] that there was a wastage or loss of the snow or ice of approximately 10% after it came out of the machine. This loss was undoubtedly due to the fact that some of the blocks had striations in them [III. 965] and that they

were of different densities. Hood testified [III. 965, 966]:

“Q. One end was hard and the other was soft?

“A. Oh, various points in that block at times.

“Q. It was not a satisfactory block, was it?

“A. Well, from a refrigeration standpoint it was cold. It was not what we wanted to make; no. We wanted to build a uniform product.

“Q. When you got that block out it sometimes cracked, didn’t it, or went to pieces?

“A. Oh, it would crack occasionally but it didn’t shatter.”

Not only was the operation of the machine not satisfactory but the quality of the solid carbon dioxide blocks produced therefrom was not commercially acceptable even though it could be sold in a market where the demand far exceeded the supply. Is it not more logical that one of the reasons impelling the discontinuance of the Martin prior use machine was the failure of said machine to produce blocks of carbon dioxide which would have sufficient density to stand up in commercial use? The fact that blocks of carbon dioxide produced by such machine could be sold in a demand market does not justify a Finding that the machine was successfully and commercially used.

We have heretofore pointed out some of the discrepancies in the testimony of Hood, Martin and Eppembach relative to the number of Martin prior use machines which were manufactured. There are a number of other discrepancies in the testimony of these witnesses which emphasizes the necessity of strictly scrutinizing and weigh-

ing oral testimony as to events occurring approximately twenty years ago. Hood testified [III. 930] that he definitely recalled one of the machines in the building of Liquid Carbonic and a second just outside the door alongside the building. He further testified that these machines were covered with grease to protect them as they were expected to be used in the future [III. 930]. He further testified that when Dry Ice Corporation moved from the Liquid Carbonic plant to the plant of the General Carbonic Corporation in Long Island City that he doesn't recall whether the Martin prior use machines were transported there. However, he did remember that one was stored at Eppenbach's [III. 935]. Martin testified [II. 596] that one of these prior use machines of the type shown in Ex. O was setting in the scrap pile outside of the General Carbonic plant and was moved from the Maspeth plant of the Liquid Carbonic Corporation. As to the other two, which he originally remembered, he testified one was outside of the Maspeth plant and one eventually went back to Eppenbach's [II. 596].

Eppenbach testified that he first met Martin in October of 1924 [III, 1296], although Martin testified that he entered the employ of Dry Ice Corporation in January of 1925 and supported said statement with Dfts. Ex. S [IV. 1391]. Eppenbach further testified that when first constructed the Martin prior use machine had a side entry for the carbon dioxide gas and with a cylinder mounted with a canvas bag thereon [III. 1264, 1265]. Neither Hood nor Martin testified to any such construction. Eppenbach further testified [III. 1265] that the snow or solid carbon dioxide was produced inside of the pressing cylinder in the first machine which was made and that

later a metal screen was found to be satisfactory. This is not in accordance with the testimony of Martin or Hood. In addition, Eppenbach testified that there was a wooden cylinder connected with the apparatus, which is not referred to at all in the testimony of Martin or Hood.

Eppenbach stated [III. 1298] that he never was asked by Dry Ice Corporation to take back any of the three Martin prior use machines that he made and that he never did so and, furthermore, he did not know what became of them. This is directly contrary to the testimony of Hood and Martin that one or more machines were returned to Eppenbach. Eppenbach also testified [III. 1297] that all five of the remaining Martin prior use machines, including the two built by him and three built by a man named Pervis, were delivered to the Liquid Carbonic plant in September of 1925 and at that time he saw dry ice being made on the first machine which he testified had been delivered to Dry Ice Corporation. This is directly contrary to the testimony of Hood and Martin who stated that the only machine operated was discontinued prior to July 4, 1925.

The failure of the human mind to correctly recall transactions occurring many years ago is further emphasized by the fact that Martin on direct examination testified that the removal of the Dry Ice Corporation to the plant of the General Carbonic Corporation took place in the fall of 1926 [II. 523, 524]. Upon cross-examination he stated that he might be mistaken as to this date [II. 590]. Hood was positive on direct examination that the removal took place in the summer of 1926 [III. 930], and upon cross-examination he again so testified [III. 993].

Eppenbach, on the contrary, testified [III. 1289, 1290] that the Dry Ice Corporation was making dry ice at the General Carbonic plant and also at the Liquid Carbonic plant in May of 1925 and supported this statement by a notation in Ex. VV dated May 26, 1925, which had reference to an ice box installed for Dry Ice Corporation in the General Carbonic plant. Eppenbach further testified that the blocks of solid carbon dioxide which were used to refrigerate a large ice box constructed by his concern were obtained from the General Carbonic plant when operated by Dry Ice Corporation [III. 1294]. The testimony of Eppenbach is corroborated by the testimony of Cole and McLaren who both testified that the removal took place in the spring of 1925. The variance in the testimony becomes significant because when the removal took place in May 1925, Martin did not think enough of the Martin prior use machines to move them to the General Carbonic plant and install them for operation even at a time when the snow tanks had not yet been constructed and there was, according to the testimony of Hood, a demand for dry ice.

The unsupported testimony of three witnesses, whose memories are vague as to many details and whose testimony conflicts as to numerous other essential facts, is wholly unsupported by any documentary evidence describing the Martin machine. It is submitted that this type of evidence is that referred to in the case of *Coffin v. Ogden*, *supra*. This evidence is not sufficient to establish that the Martin prior use machine was constructed and operated as testified to by said witnesses, or that it was openly and commercially successfully used. It is evidence which is subject to the criticism expressed by the Supreme Court

in the *Barbed Wire* case, 36 L. ed. 154, at 158, 159, 143 US 275:

“Thus far we have considered, as bearing upon the state of the art, devices, the character, construction, and scope of which were exactly defined in the specifications and drawings of actual patents, the only question presented being the proper interpretation of such patents, and the bounds they had set to the ingenuity of succeeding inventors. We have now to deal with certain unpatented devices, claimed to be complete anticipations of this patent, the existence and use of which are proven only by oral testimony. In view of the unsatisfactory character of such testimony, arising from the forgetfulness of witnesses, their liability to mistakes, their proneness to recollect things as the party calling them would have them recollect them, aside from the temptation to actual perjury, courts have not only imposed upon defendants the burden of proving such devices, but have required that the proof shall be clear, satisfactory, and beyond a reasonable doubt. Witnesses whose memories are prodded by the eagerness of interested parties to elicit testimony favorable to themselves are not usually to be depended upon for accurate information. The very fact, which courts as well as the public have not failed to recognize, that almost every important patent, from the cotton gin of Whitney to the one under consideration, has been attacked by the testimony of witnesses who imagined they had made similar discoveries long before the patentee had claimed to have invented his device, has tended to throw a certain amount of discredit upon all that class of evidence, and to demand that it be subjected to the closest scrutiny. Indeed, the frequency with which testimony is tortured, or fabricated outright, to build up the defense of a prior use

of the thing patented, goes far to justify the popular impression that the inventor may be treated as the lawful prey of the infringer. The doctrine was laid down by this court in *Coffin v. Ogden*, 85 U. S. 18 Wall, 120, 124 (21:821, 823), that 'the burden of proof rests upon him,' the defendant, 'and every reasonable doubt should be resolved against him.

* * * ”

See, also:

Deering v. Winona Harvester Works, 39 L. ed. 153, at 159, 155 US 284;

United Shoe Machinery Corp. v. Day Wood Heel Co., 46 F. 2d 897 (CCA 6);

D. W. Bosley Co. v. Wirfs, 30 F. 2d 667;

W. W. Sly Mfg. Co. v. Central Iron Works, 246 F. 707 (CCA 7);

Diamond Patent Co. v. S. E. Carr Co., 217 F. 400 (CCA 9).

This court in the *Diamond Patent Co.* case, in reversing the lower court on a Finding of prior use, pointed out that the prior use must be something more than an incidental or casual one and in addition should be an established fact acceptable to the public and contributing definitely to the sum of human knowledge (p. 402) and

“* * * Under the rule established by these decisions, we are required to view with caution and careful scrutiny evidence which is introduced to show a prior use that destroys the pecuniary value of a patent, which has met with commercial success and has been of value to the community.”

Abandoned Experiment.

The Martin prior use machine was experimental and abandoned even assuming that this court would find that it was constructed and operated in the manner testified to by Martin, Hood and Eppenbach. The evidence is clear that the machine as constructed was frequently changed due to difficulties in operation and over a period of a relatively short time; that difficulties were encountered even after the last change made in the structure; that the quality of dry ice produced by the machine was commercially unsatisfactory; that the machine was abandoned forever in the face of a demand for production; that additional machines were constructed at considerable cost and were not even operated; that the snow tank, with its admitted disadvantages, was substituted for the Martin prior use machine as a means of production.

The fact that no patent application was ever filed covering the alleged Martin prior use [II. 601] is also evidence that the machines were experimental and abandoned in view of the activities of Martin in making other inventions and endeavoring to secure patents thereon. Defendants' Ex. S [IV. 1391] has attached thereto as Schedule A a list of the patents and patent applications of Martin [IV. 1405-1412]. This schedule shows that from early in 1926 and continuing throughout the entire period of his employment with the Dry Ice Corporation Martin made a number of inventions pertaining to the carbon dioxide art, approximating nineteen in number. In the face of this activity as an inventor and in filing applications, Martin did not consider the Martin prior use machines to be sufficiently important to be included in a patent application. In view of this activity the only reason for

the failure to file upon the Martin prior use would be the fact that he considered it to be an abandoned experiment and of no practical use to the industry.

In addition the only documentary evidence produced by the appellees which would tend in any manner to prove the prior use was the Eppenbach records Ex. VV [IV. 1377-1389a). These records on their face refer to the Martin prior use machines as "experimental." Page 427 of said exhibit [IV. 1388], under date of June 11th, refers to castings on experimental work on snow machines. Eppenbach identified this as work which was done on the Martin prior use machines [III. 1282, 1283]. On page 418 of Ex. VV [IV. 1384], and under date of April 25th, the following notation appears:

"Make pyramid shape piece for experimental purposes on snow machine #1 covered with brass mesh."

Eppenbach in his deposition recognized that the machines were experimental [III. 1256]:

"I assisted in the design of the equipment, the experimental machine."

[III. 1268]:

"In appearance they were practically the same. The advantages of the experiments of the first machine was incorporated in the second and third."

(It may be pointed out that the second and third machines, although incorporating the results of the experiments of the first machine, were admittedly never operated.) Therefore, the only record produced which tends in any manner to support the Martin prior use is evidence that the machines were experimental. That they were abandoned is admitted. This evidence would clearly support a Find-

ing that the use, if established beyond a reasonable doubt, was experimental and abandoned. The court made no Finding as to whether the operation was experimental or as to whether it was abandoned and this court is at liberty to make its own Findings in respect thereto.

The law is clear that an abandoned experiment is not such an anticipation as will defeat an issued patent. In the *Barbed Wire* case, *supra*, in discussing the effect of an abandoned experiment, the court stated (p. 159):

“* * * If the thing were embryotic or inchoate; if it rested in speculation or experiment; if the process pursued for its development had failed to reach the point of consummation, it cannot avail to defeat a patent founded upon a discovery or invention which was completed, while in the other case there was only progress, however near that progress may have approximated to the end in view.’ This case was subsequently cited with approval in *Cantrell v. Wallick*, 117 U. S. 689, 696 (29:1017, 1019), and its principle has been repeatedly acted upon in the different circuits. *Hitchcock v. Tremaine*, 9 Blatchf. 550; *Parham v. American B. O. & S. Mach. Co.*, 4 Fish. Pat. Cas. 468; *American Bell Teleph. Co. v. People’s Teleph. Co.*, 22 Fed. Rep. 309.”

See, also:

Deering v. Winona Harvester Works, *supra* (p. 159).

This court in *Kings County Raisin & Fruit Co. v. U. S. Consolidated Seeded Raisin Co.*, 182 F. 59, at 63, in affirming an order granting a preliminary injunction, cited the above case with approval, stating:

“It would seem that it was one of those unsuccessful and abandoned inventions which are held to have no place in the art to which they relate.”

In *Consolidated Contract Co. v. Hassam Paving Co.*, 227 F. 436, at 441, this court, in disposing of an alleged prior use upon the ground that it was an abandoned experiment, stated:

“The experiment was not satisfactory, but, as the witness said, ‘demonstrated that I might have something of practical value, but that I had not carried it far enough, or experimented enough at length, to demonstrate its practical value.’ The pavement laid by McClintock was never used elsewhere or tried again. We agree with the learned judge of the court below that McClintock’s venture comes clearly within the category of an abandoned experiment, which is not sufficient in law to anticipate a successful patent. The Cornplanter Patent, 23 Wall. 181, 23 L. Ed. 161; *Smith v. Goodyear Dental Vulcanite Co.*, 93 U. S. 486, 23 L. Ed. 952; *Deering v. Winona Harvester Works*, 155 U. S. 286, 15 Sup. Ct. 118, 39 L. Ed. 153; *King County Raisin & Fruit Co. v. U. S. Consolidated Seeded Raisin Co.*, 182 Fed. 59, 104 C. C. A. 499.”

Claimed Disclosure of Martin

Prior Use to McLaren.

The trial court found (Finding 19) [I. 76] that the evidence established that Martin and Hood disclosed a construction of the Martin prior use machine to McLaren, one of the inventors of the patent in suit, as early as October 1926. The court did not find that the evidence established such a fact beyond all reasonable doubt. The degree of proof necessary to establish such a fact is as high a degree of proof as is required in establishing a prior use. The Circuit Court of Appeals for the Eighth

Circuit in the case of *Ottumwa Box Car Loader Co. v. Christy Box Car L. Co.*, 215 F. 362, in commenting upon this type of evidence, stated at 366:

“The testimony on this issue is therefore conflicting. The legal presumptions, that arising from the patent and that arising from the undisturbed title and use of the patented monopoly by Christy and his successors in interest for more than a decade, are in favor of the claim of the patentee. Christy was the man who was seeking and who needed a box car loader, and Moses was his employe, hired and paid to do as he directed. It is easy for one, employed to construct a machine upon a principle disclosed by his employer, to come to think and to say as he works out the mechanical details, and afterwards to believe and testify, that the invention itself was his. But testimony of this nature produced by an alleged infringer, to destroy a patent unchallenged for years, ought not to prevail unless it is clear and conclusive. *Thomson-Houston Elec. Co. v. Winchester Ave. Ry. Co.* (C. C.) 71 Fed. 192, 199; *Eastern Dynamite Co. v. Keystone Powder Co.* (C. C.) 164 Fed. 47, 56; *United Shirt & Collar Co. v. Beattie*, 149 Fed. 736, 79 C. C. A. 442, 447. * * *”

The late Judge James, an able patent Judge, in the case of *Roberti v. Jonas*, 300 F. 181, also commented upon this type of evidence, stating at 184, 185:

“A defense of this kind, as I understand the law, must be clearly established by satisfactory evidence, and, viewing all of the testimony given, this issue, I think, under that measure of proof, must be decided against the defendant. * * *”

In *Protector Last Re-Enforcing Co. v. John Pell & Son*, 204 F. 453, at 461, the necessity for the appellees

establishing facts of this nature beyond a reasonable doubt is clearly stated:

“Testimony of the character under consideration, adduced for the purpose of defeating a patent, should be of such dignity and weight as to satisfy a court beyond any reasonable doubt of its accuracy, or else it should be unhesitatingly rejected. Were the rule otherwise, no patent would be safe against an insidious assault of this character. The attempt made to reinforce the evidence referred to by certain outside correspondence is ineffective for that purpose. It is obviously open to too many interpretations, other than that put upon it by defendant’s counsel.”

See also:

Manton-Gaulin Mfg. Co. v. Dairy Machinery & C. Co., 238 F. 210, at 215;

Eastern Paper Bag Co. v. Continental Paper Bag Co., 142 F. 479, at 501, 502.

The nature of the defense that the inventors were not the original inventors and that the invention was disclosed to them by others, inferring a fraud upon the United States Government which would be liable to subject the inventors to criminal prosecution is such that this high degree of proof is necessary. In *United States v. American Bell Telephone Co.*, 42 L. ed. 144, at 154, 167 US 226, at 241, the United States Government brought an action against the defendant for the revocation or cancellation of certain patents upon the ground that the patents had been secured by fraud in that the inventors were not the original inventors but that the inventions had been disclosed to them by others. The Supreme Court

stated at p. 154 the degree of proof necessary in such cases:

“‘We take the general doctrine to be, that when in a court of equity it is proposed to set aside, to annul, or to correct a written instrument for fraud or mistake in the execution of the instrument itself, the testimony on which this is done must be clear, unequivocal and convincing, and that it cannot be done upon a bare preponderance of evidence which leaves the issue in doubt. * * *’”

Although the *United States v. American Bell Telephone Co.* was a case in equity for cancellation of a patent, the issue as to originality was the same issue raised in this case. The finding of the lower court which fails to find the establishment of this fact beyond a reasonable doubt is of no assistance to this court. An examination of the evidence shows that the fact was not proven with that certainty which is required by the law.

The alleged disclosures took place on the premises of the General Carbonic Corporation in Long Island City. The witnesses were able only to testify as to the substance of the conversations. Martin testified [II. 564] that Hood was present during his conversations with McLaren and that, in addition, he thought a Mr. Fitzpatrick and a Mr. Sherwood were also present. Neither Fitzpatrick nor Sherwood were called as witnesses to corroborate the testimony of Martin and Hood. Hood on the contrary testified [III. 990] that he did not recall being present or overhearing any conversation between McLaren and Martin in which any disclosure was made [III. 991]:

“No; not what was actually said, more than the opening of the conversations.”

Martin testified [II. 597] that he had no recollection of McLaren ever seeing the Martin prior use machine in the scrap pile outside the General Carbonic plant. It will be recalled that Martin testified that the Martin prior use machine was brought over from Liquid Carbonic to General Carbonic and stored in the scrap pile. There is no testimony that Martin offered to show McLaren this prior use machine, which was readily available, nor is there any testimony that Martin exhibited any drawings or sketches of the machine to McLaren. Furthermore, Martin did not testify that McLaren asked any questions at all about the prior use machine either as to its construction, operation or where it was located. Hood testified [III. 986] that McLaren did not ask any questions at all about the construction or operation of the Martin prior use machine nor is there any testimony that Hood showed any sketches to McLaren [III. 982] and Hood, furthermore, did not show McLaren the Martin prior use machine which was allegedly in the scrap pile. In fact Hood testified [III. 936] that on many occasions he gave McLaren a description of the Martin prior use machine:

“A. * * * I am certain I, on many occasions, gave him as complete a description as I was capable of, * * *”

* * * * *

“Q. And also conversations along those lines took place at other time?

“A. A great many times.”

The natural and logical thing for both Hood and Martin to do instead of describing the Martin prior use to McLaren on many occasions would be to show him the machine which was only a few feet away.

There is no testimony in the record that Martin or Hood ever made any disclosure of the Martin prior use machine to Cole. Cole was the superior and in authority to McLaren and was frequently in the plant of the General Carbonic Corporation and made complaints as to the inefficient operations of the snow tank. The reason given by both Martin and Hood for making the disclosure to McLaren was the complaint of the loss of gas and the inefficiency of the operation of the snow tank. The natural reaction of the witnesses Hood and Martin would have been to make a disclosure to Cole, Manager of all plants for General Carbonic Corporation, during conversations with him concerning the inefficiency of the snow tank operation. The testimony of Martin [II. 565] that he discussed both with McLaren and Hood the possibility of doing pressing, *tamping* and snow formation in one housing, is not in accordance with the reasons given for making the disclosure to McLaren inasmuch as tamping was one of the inefficient operations of the snow tank and resulted in loss of gas.

McLaren, called as a witness for the appellant, denied [III, 1212] that he had ever seen any of the Martin prior use machines or that he had ever had any conversations with either Martin or Hood relative to the same, and including the period of time when the purported conversations were supposed to have taken place. Cole also denied any knowledge of the prior use machines or that he had any conversations with either Hood or Martin relative to the same. The evidence relative to this alleged disclosure to McLaren is another example of the inability of witnesses after the lapse of many years to correctly recall evidence and on the other hand to resort to figments of their imagination in giving testimony. The disclosure

to McLaren not only was not established beyond a reasonable doubt but it was such testimony as the trial court should not have given credence to. The error of the trial court in so doing is a concrete example of the many errors into which the court fell during the trial of this case. In view of the Finding made, this court is free to make its own Finding as to any such alleged disclosure. Credence to testimony of this nature is a concrete example of the many errors into which the court fell during the trial of this case.

**Fig. 5 Not Anticipated by
Claimed Martin Prior Use.**

If this court should find that Hood and Martin disclosed the Martin prior use machine to McLaren, as found by the lower court, the Finding would not be a Finding of the disclosure of the vertical apparatus of Fig. 5. Martin testified [II. 565] that the machine he disclosed to McLaren was a pressing, tamping and snow forming machine under one housing. This was not the vertical apparatus of Fig. 5. The trial court was led into further error in so finding in Finding 18. This Finding, to the effect that the Martin prior use machine contained elements in the same relationship and with the same function as required by the claims of the patent in suit, is not supported by the evidence.

The Martin prior use does not have any vertical solidification pressing chamber, there is no pressing piston operated by fluid pressure, there is no closing head. In addition, there is no vertically reciprocal pressing plunger nor fluid pressure means for operating this plunger. There is no such thing as a raised inactive position for the pressing plunger and there is a very serious question

whether there is even means for withdrawal of the gas from the chamber during the formation of the solid because of the failure of the screen in said Martin prior use to properly function. The Martin machine was not a vertical press as shown in Fig. 5. It consisted of a chamber in which carbon dioxide was formed and a separate pressing chamber in which the solid carbon dioxide was pressed into blocks. This is quite dissimilar to the construction of the apparatus of Fig. 5 where the pressing and the forming of the solid carbon dioxide takes place in the same chamber. The Martin prior use machine was admittedly an extrusion machine wherein the solid carbon dioxide blocks were made by extruding continuous long ribbons or blocks of dry ice [II. 528, 540, III. 926]. As testified to by Martin [II. 540], an extrusion press apparatus performs in the same way that a tube of tooth paste does, that is extrudes a continuous ribbon or bar of material. The press operated horizontally by means of a reciprocating fixed stroke piston. This piston made approximately ten to twenty revolutions per minute and in fact operated as a tamping machine. This was admitted by Martin on cross examination [II. 602]:

“It would be, if the thing was running free, it would be analogous to tamping. It is properly incremental pressing—pressing new increments in. It didn’t operate very satisfactorily in that manner.”

There was no pressure gauge on the machine to determine the pressure in either the snow forming or pressing chamber and there was no vent to reduce the pressure until it was found impossible for the press to function due to high pressures in the pressing chamber [II. 578-580, 609], and even after use of a vent Martin admitted [II. 602] that it was almost impossible to drive the press-

ing plunger during the later stages of the development of the Martin prior use machine. That Martin did not consider or realize that the solid carbon dioxide could be formed in the same chamber into which it was pressed into solid blocks of dense carbon dioxide is clearly shown by reference to his patent 1,887,692 [Dfts. Ex. EE-24] [IV. 1523]. In said patent specifications, p. 1, ll. 43-73, the inventor Martin and the same Martin who testified as to the alleged Martin prior use stated:

“I have discovered that the production of blocks of dense, tough, structurally sound solid carbon dioxide cannot be accomplished merely by one direction pressure applied by a piston which constitutes one wall of a molding chamber. This is because of the gases that are intimately bound in the pores of the lumps of snow. These lumps consist of broken fragments of the deposit formed in the snow chamber and these deposits consist of crystals that are welded together so as to enclose great quantities of finely subdivided CO₂ gas. In practice, it is found that the molding pressure expels very little of this gas. Consequently, the gas is highly compressed with and sealed in the snow and this results in a complete block that is under great internal tension, making it structurally weak.

“Preferably, such expulsion is accomplished by a tamping operation carried out by tamps or crushers that are of much less area than the snow surface against which they strike. The action of the tamps on local areas of the snow mass expels the air and gases through the surface of the snow adjacent the tamps. This tamping also snugly compacts the mass by breaking down the snow crystals and prepares it for the final compressing and molding operation which forms it into tough, hard blocks free of gas and air bubbles.”

In this patent, filed December 15, 1928, at a time when the vertical press of Fig. 5 was coming into the commercial field, Martin was endeavoring to teach the art that it would be impossible to produce blocks of dense, tough, structurally sound solid carbon dioxide by pressing the same in one direction against a wall of a molding chamber and that it would be necessary to *tamp* the solid carbon dioxide in order to get the proper density of block. This teaching is directly contrary to Martin's testimony that any commercially satisfactory blocks of solid carbon dioxide were produced in the Martin prior use machine where there was only one direction of pressing. The statement in this patent filed more than three years after the alleged prior use would not have been made if the Martin prior use machine was a successful operation and produced the proper density of solid carbon dioxide blocks. The teaching is in accordance with the evidence in this case that:

- (1) The use never took place; or
- (2) if it did, it was an abandoned experiment.

Furthermore, it is proof that any use by Martin prior to the filing date of the application for this patent did not teach or disclose to him that dense blocks of solid carbon dioxide could be manufactured in the same chamber in which the solid carbon dioxide was formed and free from contact with the air.

The finding that the witnesses Martin and Hood disclosed the Martin prior use to one of the inventors, McLaren, is not only not supported by the evidence but is not a disclosure of the vertical apparatus of Fig. 5 to which the claims in issue are directed.

The Vertical Apparatus of Fig. 5, to Which the
Claims in Issue Are Directed Constitutes
Invention and Said Inventions Is New
and Patentable.

The apparatus claims in issue, of which claim 34 set forth in the statement of the case is typical, cover a combination of elements. There is no claim that any of the elements are patentable *per se*. The appellant in its bill of particulars [I. 2, 3] specifically pointed out that the invention involved was in the combination and that for the purposes of this litigation there was no claim that any of the elements were novel. The Supreme Court in *Hailes v. Van Wormer*, 20 Wall. 353, at 368, early determined that invention could reside in a new combination of elements. Such is the case even though all of the elements are old in the art and were used therein. This law is well established and is the law of this Circuit. See:

Bliss v. Spangler, 217 F. 394;

Paraffine Companies v. McEverlast, Inc., 84 F. 2d 335, at 341.

In considering this case, the trial court repeatedly referred to individual elements and his failure to distinguish between invention in a combination of elements as an entirety and in individual elements led him into a fundamental error. This error is well exemplified by the court's Finding of Fact 20 in which he found that appellant's expert, Dr. Jones, admitted there was nothing new or novel in the invention of the vertical apparatus of Fig. 5 to which the claims in issue are directed except individual elements. A reading of Dr. Jones' testimony

clearly shows the error into which the court fell. The court [III. 1170] asked this question of Dr. Jones:

“What do you consider to be new and in the nature of an invention about this patent in suit, as you understand the prior art which has been discussed here, and as you understand the information and knowledge to which the man skilled in the art had access at that time. That is the question. Do you understand it?”

Dr. Jones in replying first considered the question as to individual elements and then considered the question as to the combination in its entirety. At page 1170 he stated:

“As to structural elements in the apparatus of Fig. 5, I see two elements there peculiar to its use with carbon dioxide: The double jacket, 102, and the dividing or separating members 110. But with those minor exceptions I see no novel mechanical element in the apparatus itself whatsoever.” (Emphasis ours.)

Dr. Jones thereafter continued his discussion of the question of invention and on pages 1172 and 1173 stated the reasons why he considered the combination of elements of the vertical apparatus of Fig. 5 to constitute invention. Clearly there is no basis for the Finding of the court to the effect that the witness found no invention in any except individual elements of the patent in suit when the individual elements he referred to are not contained in the claims in issue and when he thereafter informed the court as to what he thought the invention of the patent in suit was in the claims in issue as covered by the vertical apparatus of Fig. 5.

This error of the court is also apparent in Finding of Fact 23 [I. 79] wherein the court found:

“The patent in suit lacks invention in view of the state of the art.”

The art referred to includes the art specified in Finding 23 [I. 78, 79]. Although the court in said Finding referred to individual elements and to the operation and construction of apparatus for producing solid carbon dioxide, there was no Finding that anyone skilled in the art had knowledge of or used any prior art structure for manufacturing carbon dioxide containing the combination of elements of the vertical apparatus of Fig. 5. The court in said Finding did not consider the contribution which the Cole and McLaren invention made to the art. The court by this error failed to properly consider whether the invention resided in the combination. Other claims of the patent in suit not in issue include as elements therein the exhauster 81 referred to in Finding 20, and also include and are limited to the horizontal machine shown in Fig. 2. If the court had appreciated the language of these claims, it would have been apparent that the claims in issue were not limited thereto and that these claims covered different combinations of elements. That each claim should be considered as a separate invention has been recognized by the Supreme Court in the case of *Smith v. Snow*, 79 L. ed. 721, at 729, 294 US 1, wherein the court stated:

“Thus by striking and obviously intended contrast with other claims, Claim 1 covers broadly the essential elements of the Smith invention as we have already described it.”

The trial court, by failing to consider the claims in issue as a combination of elements and steps, was unable to appreciate that the inventors Cole and McLaren had contributed to the carbon dioxide art a vertically disposed apparatus which was so constructed that the solid carbon dioxide, composed of flakes or crystals, could be formed in the same chamber and thereafter pressed into dense blocks within the same chamber and without contact from the atmosphere. In so failing, the court was unable to properly evaluate the invention residing in said combination of elements.

This contribution of the inventors was not disclosed in the prior art. There is no Finding that any prior art patent pertaining to the carbon dioxide art contained the combination of elements of the claims in issue. We have previously disposed of the eleven patents, none of which pertain to the carbon dioxide art, which the court found to anticipate the invention of the vertical apparatus of Fig. 5 in Finding 28 [I. 80]. Finding 29 [I. 81] specifically finds that there is no inventive change in the claims in issue over the disclosure of the patents specified therein. All of these patents pertain to the carbon dioxide art. Not only do these patents fail to disclose the combination of elements of the claims in issue but they also fail to even appreciate or approach the problem of having the solid carbon dioxide pressed in the same chamber in which it is formed and without contact with the air. The patents specifically enumerated in Finding 29, together with the eleven patents specified in Finding 28, are the only patents which the court found either anticipated the patent in suit or disclosed the apparatus without inventive change.

Referring to said patents, Flemming 995,454 [Defts. Ex. EE-8] [IV. 1444] and Julius 1,018,568 [Defts. Ex.

EE-9] [IV. 1447] may be considered together. They both relate to the manufacture of snow sticks of carbon dioxide. Both patents disclose a metal container for carbon dioxide gas and a tube through which the gas may be released under pressure into a perforated cylinder. This perforated cylinder is exposed to the atmosphere and air may readily enter and come in contact with the solid flakes or crystals. In addition the perforations allow the flakes or crystals to extrude through the perforations. The small sticks are pressed into shape in Flemming by a hand operated plunger and in Julius by a hand operated screw mechanism. The structures were obviously not designed for the manufacture of commercial blocks of solid carbon dioxide and although they may have been capable of forming sticks of carbon dioxide for use in the medical profession in freezing tissue, for example, they gave no assistance to the problem of producing dense blocks of solid carbon dioxide and without contact from the atmosphere. In addition both patents show the solid carbon dioxide being shaped into sticks by a horizontal compressing operation instead of the vertically disposed operation, as shown in Fig. 5, which results in better distribution of the product to be pressed.

The two patents to Slate 1,643,590 [Defts. Ex. EE-18] [IV. 1486] and British 237,681 [Defts. Ex. EE-28] [IV. 1547] show substantially the same structure and may be considered together. Prof. Clapp [II. 856] admitted that other means for escape of the gas than that provided for in the Slate patents should be provided. He further admitted that the chamber should not be vented to the atmosphere during the operation in which the expansion of the carbon dioxide is driving the piston upward, as shown in Fig. 7 of the U. S. patent [IV. 1486]. In the

patent drawings the chamber in which the solid carbon dioxide is formed is open to the atmosphere and would result in the formation of water ice on the walls of the cylinder which would freeze and interfere with the action of the piston. Furthermore, the air would enter the compressor system as there is nothing which would prevent it from so doing. In fact Prof. Clapp, after considerable cross examination, finally admitted that the proposal in the Slate patent that the energy necessary to drive the piston to compress the snow should be derived from the momentum of the flywheel was ridiculous [II. 867] and, upon being questioned by the court [II. 868] stated:

“The Court: One further question: If you were starting out to build a device, back in the early twenties, and had these various disclosures in the prior art, you would not pay much attention to this particular device, if you were going to build a machine?”

“A. I would not give it a second glance.”

In spite of this testimony, the court found that these Slate patents contained disclosures which were pertinent upon the question of the invention of the patent in suit.

The only other patent specified in Finding 29 is the patent to Martin 1,887,692 [Defts. Ex. EE-24] [IV. 1522]. The application for this patent was filed December 15, 1928. The application is a divisional application of an application having an earlier filing date of December 6, 1926. Regardless of the effective date of this application, it is subsequent to the date of invention of the patent in suit. The testimony of the inventors Cole and McLaren, which is not disputed, is that the invention was made in the fall of 1925. The invention was disclosed in

the abandoned application of McLaren filed October 29, 1926 [Defts. Physical Ex. PP]. The appellees, although calling Martin as a witness, did not endeavor to go back of Martin's filing date. Regardless, however, of the question as to whether the Martin invention is in fact prior to the invention of the patent in suit, said patent does not disclose or in any way suggest the invention of the vertical apparatus of Fig. 5 as covered by the claims in issue. This patent leads the art in another direction. In said patent specifications p. 1, ll. 44-73, the inventor Martin instructs and teaches the art that that dense, tough, structurally sound solid carbon dioxide blocks cannot be manufactured by direction pressure applied by a piston which constitutes one wall of a molding cylinder. He points out that it will be necessary to perform the separate operation of tamping in order to secure the proper density of blocks. This is substantially the teaching of the Martin snow tank and it cannot be over emphasized that Martin constructed and used the snow tank as a commercial structure after abandoning the alleged Martin prior use. The Martin patent shows a formation of carbon dioxide in a chamber and with the pressing of the carbon dioxide, after tamping, in another entirely different chamber. Means are shown for closing one chamber from the other. Furthermore, one end of the press is shown open to the atmosphere (24 of Fig. 2). In addition the press shown is a horizontal press. Obviously this patent does not disclose the structure of the vertical apparatus of Fig. 5 and the teachings thereof are in fact contrary to the mode of operation of the claims in issue.

The contribution of the inventors to the art, as covered by the claims in issue, is not included in the horizontal

apparatus of Fig. 2 of the drawings. An examination of the drawings of the two machines will at once disclose the fact that they are not similar in structure. The apparatus of Fig. 2 is horizontal. The apparatus of Fig. 5 is vertical. In the apparatus shown in Fig. 2 the solid carbon dioxide is formed in one chamber and pressed in another. In the apparatus of Fig. 5 the pressing and forming of the solid carbon dioxide takes place in the same chamber. In the apparatus of Fig. 2 means are shown to propel or transfer the solid carbon dioxide into the pressing chamber. Such means are not present or essential for the operation of the apparatus of Fig. 5. The same difficulty would be encountered in this horizontal apparatus of Fig. 2 as was admittedly encountered by Martin in getting the carbon dioxide into the lower pressing chamber of his alleged prior use and which admittedly caused him to change the construction. The mode of operation of the two machines is not the same. In the apparatus of Fig. 2, as previously stated, the pressing and forming of the solid carbon dioxide is in two separate chambers. In the apparatus of Fig. 5 the carbon dioxide is formed in one chamber and pressed into blocks without being moved from the position the flakes or crystals assumed when formed. There is no evidence in the record that the horizontal machine of Fig. 2 could be satisfactorily operated using the triple point method or any other method except the snow method where low pressures are utilized. The depositing of the carbon dioxide into the pressing chamber of Fig. 2 affects the character of the charge of solid which is available for pressing the block [I. 231]. In the apparatus of Fig. 5 the distribution is such that no such problem arises. The fact that the horizontal apparatus of Fig. 2 has completely disappeared from the market, even

though it was used to some extent prior to the construction of the vertical apparatus of Fig. 5 in the fall of 1928 should be compelling evidence that it does not contain the same elements or have the same mode of operation as the vertical apparatus of Fig. 5. Notwithstanding the differences in structure and mode of operation, the court found in Finding 16 [I. 74] that the horizontal apparatus of Fig. 2 contained the same structural elements as the vertical apparatus of Fig. 5 and, in addition, that said elements had the same relationship and performed the same function and produced the same result as the elements in the vertical apparatus. This error of the court also contributed to the failure of the lower court to properly approach and to evaluate the question of invention.

The fact that the vertical apparatus of Fig. 5 was a radical departure from the operations of the industry is shown by the testimony of McLaren, called as a witness on behalf of the appellees. McLaren testified [III. 1027]:

“A. Yes. Very little thought was given to this because it was such a wild idea, we were afraid of it.

“The Court: By ‘this’?

“A. This vertical machine. In other words, the company did not want to have anything to do with it. They said, No, we are afraid of that thing.”

This fear resulted in the General Carbonic Corporation first building the horizontal machine of Fig. 2. The resultant difficulties in attempting to operate this machine are covered by Mr. Cole in his testimony [I. 326, 331]. It was not until the inventors persisted and built the vertical machine of Fig. 5 that all difficulties were solved with the resultant universal use of the machine in the industry.

The trial court in making Finding 16 was either seeking to find individual elements of novelty within the horizontal machine of Fig. 2 and the vertical machine of Fig. 5 or he failed to appreciate that the evidence was contrary to said Finding.

That the contribution of the inventors to the art, as covered by the claims in issue, was not obvious is not only shown by the failure of Martin patent 1,887,692 to appreciate the problem or to disclose the same but also by the fact that not one of the prior art patents which pertains to the carbon dioxide art, and relied upon by the appellees, in any manner suggested or disclosed said contribution. The early patent to Elworthy, British 7436 of 1895 [Defts. Ex. EE-27] [IV. 1539], although suggesting the use of solid carbon dioxide compressed into blocks or slabs for commercial use, shows the forming of the carbon dioxide in one chamber and the pressing in another chamber which is exposed to the atmosphere and with the pressing operations being performed in some form of horizontal press. Not one of the carbon dioxide patents relied upon by appellees which are subsequent to Elworthy and during the period from 1895 to the date of the invention of the patent in suit disclose the possibility of utilizing such an apparatus as the vertical apparatus of Fig. 5 for pressing and forming the solid carbon dioxide in one chamber and without contact from the atmosphere.

That the contribution of the inventors Cole and McLaren to the art was not obvious is also shown by the fact that Martin, after abandoning his alleged prior art structure, used in commercial operations the snow tank with its admitted resultant disadvantages. Furthermore, Dr. Jones, who is without question one of the foremost

experts in the carbon dioxide art and who was coauthor of one of the foremost works on carbon dioxide, although realizing the necessity for an apparatus which would displace the snow tank and enable the industry to use the triple point method, did not have any solution. Dr. Jones was in the employ of the Dry Ice Corporation when he first saw the vertical apparatus of Fig. 5 in the latter part of 1928. With his knowledge of the disadvantages of the commercial apparatuses that were then being used, he immediately realized, upon seeing the vertical apparatus of Fig. 5, that it was a dual machine that would operate on triple point as well as on snow and that it was the very thing for which he had been looking [I. 369]. Dr. Jones appreciated the contribution which the inventors had made to the art and in testifying [III. 1173] stated that in his opinion the invention was in short-cutting the operations of pressing and forming the snow and doing it in one structure, with the elimination of any question of tamping, the use of scrapers or other such devices, and thereafter having a finished block of carbon dioxide. He further pointed out [III. 1175] that such an operation was not contemplated by the prior use machine of Martin even though it may have been in existence, stating:

“Q. By Mr. Foster: It is not your opinion that it was new with the Cole and McLaren or in the nature of an invention by them to have the solidification of carbon dioxide and the compression of the carbon dioxide in the same chamber?

“A. Yes; it is my opinion that Cole and McLaren did invent just that. The question can't be answered without considering a definition, though, of terms when you say 'compressed,' that is, the machine, say of—well, Exhibit L, as it was described here, un-

doubtedly makes solid carbon dioxide, or Exhibit P—I guess I am confused on that—undoubtedly deposits carbon dioxide and compacts it, and it undoubtedly does it in the same enclosure; but it, to my mind, utterly fails to accomplish this result and the type of pressing is still the old idea of the school of thought of tamping that material in there. It is not in any way, shape or form the commercial result that is attained by this Figure 5 device. It has a good deal more in common with the Figure 2 device, which is not, to my mind, the outstanding contribution of the inventors to the art.”

Dr. Jones, from his knowledge of the industry, recognized that the vertical apparatus of Fig. 5 was the main contribution of the inventors to the industry. There is no issue in this case as to the validity or infringement of any claims pertaining to the horizontal apparatus of Fig. 2.

The apparent simplicity of the vertical apparatus of Fig. 5 undoubtedly influenced the court in his approach to the question of invention. The fact that the court was able to readily understand the construction and operation of the vertical apparatus of Fig. 5 from a reading of the patent is not the test of invention. The defense of simplicity and obviousness is always raised by defendants where the invention is apparently simple when viewed from hindsight. The courts have long recognized the importance of carefully scrutinizing the question of invention when an apparatus and method contribute to the sum of human knowledge and achieve commercial success even though the apparatus and method appear to be obvious after the invention has been made. In *Potts v. Creager*, 39 L. ed. 275, at 279, 155 US 596, the Supreme

Court, in reversing the decree of the lower court holding the patent invalid, stated:

“The apparent simplicity of a new device often leads an inexperienced person to think that it would have occurred to any one familiar with the subject; but the decisive answer is that with dozens and perhaps hundreds of others laboring in the same field, it had never occurred to any one before. The practiced eye of an ordinary mechanic may be safely trusted to see what ought to be apparent to every one. As was said by *Mr. Justice Bradley*, in *Webster Loom Co. v. Higgins*, 105 U. S. 580, 591 (26: 1177, 1181): ‘Now that it has succeeded, it may seem very plain to any one that he could have done it as well. This is often the case with inventions of the greatest merit. It may be laid down as a general rule, though perhaps not an invariable one, that if a new combination and arrangement of known elements produce a new and beneficial result never attained before, it is evidence of invention.’ ”

The Supreme Court again in *Diamond Rubber Co. v. Consolidated Rubber Tire Co.*, 55 L. ed. 527, at 531, 532 220 US 426, commented upon the apparent obviousness of an invention, stating:

“Its simplicity should not blind us as to its character. Many things, and the patent law abounds in illustrations, seem obvious after they have been done, and, ‘in the light of the accomplished result,’ it is often a matter of wonder how they so long ‘eluded the search of the discoverer and set at defiance the speculations of inventive genius.’ *Pearl v. Ocean Mills*, 2 Bann. & Ard. 469, Fed. Cas. No. 10,876, 11 Off. Gaz. 2. Knowledge after the event is always easy, and problems once solved present no difficulties, indeed, may be represented as never having had any,

and expert witnesses may be brought forward to show that the new thing which seemed to have eluded the search of the world was always ready at hand and easy to be seen by a merely skilful attention. But the law has other tests of the invention than subtle conjectures of what might have been seen and yet was not. It regards a change as evidence of novelty, the acceptance and utility of change as a further evidence, even as demonstration.”

This court in the case of *Bankers' Utilities Co. v. Pacific National Bank*, 18 F. 2d 16, at 18, in reversing the decree of the lower court holding the patent invalid, stated:

“The improvement wrought by the combination may be simple, but it is substantial and plainly useful. It is not found in the prior art, or covered by the claims in any of the references. While possibly it does not involve a high degree of inventive genius, it rises above mere mechanical skill, and exhibits a measure of patentable novelty.”

See also:

Baldwin-Southwark Corp. v. Tinius Olsen Testing Mach. Co., 88 F. 2d 910, at 914;

Brown & Sharpe Co. v. Wahl, 85 F. 2d 458, at 459, 460.

In fact the very simplicity may exhibit the highest trait of genius. The Circuit Court of Appeals for the Third Circuit so stated in *Aronson v. Toy Devices, Inc.*, 1 F. 2d 91, at 92, wherein the court stated:

“Mere simplification of a substantial character, disposing of parts which have long been in use, may amount to invention. ‘To obtain simplicity is the highest trait of genius.’ *Hobbs Manufacturing Co. v. Gooding et al.*, 111 Fed. 403, 406, * * *.”

The fact that carbon dioxide has peculiar characteristics should be considered by this court upon the question of obviousness. In manufacturing solid blocks of carbon dioxide it is necessary to contend with carbon dioxide in gas, liquid and solid phase. High pressures are encountered in securing the liquid carbon dioxide for use in the forming of the solid flakes or crystals, such pressures exceeding 1000 pounds per square inch. The liquid carbon dioxide is unstable at any pressure below 60.4 pounds per square inch. The temperature of the solid carbon dioxide is approximately -109° F. Solid carbon dioxide, furthermore, has the peculiar characteristic of subliming from the solid to the gas phase without going through the liquid phase. Furthermore, the industry knew the internal pressures which were built up within blocks of solid carbon dioxide and the dangers resulting in the shattering or exploding of the blocks. They also knew the dangers inherent in handling solid carbon dioxide at high pressures. All of these characteristics undoubtedly influenced the industry and contributed to the failure of the industry to realize that carbon dioxide could be pressed and formed in a vertical apparatus such as Fig. 5 and without contact from the atmosphere. The fact that the inventors Cole and McLaren were unable to persuade their employer to first construct the vertical apparatus of Fig. 5 is strong evidence of the views of the industry at that time. The jump to the vertical apparatus of Fig. 5 from the prior commercial structures was a jump which was so drastic that it could not be visioned by the industry at that time. The lower court in approaching the question of invention also failed to take these factors into consideration.

If there is any doubt upon the question of invention, because of obviousness or simplicity, it should be resolved

in favor of the patent because of the advantages gained by the adoption and operation of the vertical apparatus of Fig. 5. The vertical apparatus of Fig. 5 eliminated the necessity for tamping used in the snow tank method and which was a universal practice when the Cole and McLaren invention entered the field [I. 152]; it eliminated the loss of material approximating 10% due to the handling of the solid carbon dioxide in an open room and its subsequent tamping and pressing in the open; it eliminated the loss of gas from the supply system and the loss of gas entrapped in the solid carbon dioxide and released during the pressing operation. Martin [II. 564] admitted that the commercial structure in use prior to the Cole and McLaren invention wasted carbon dioxide gas by the opening of the doors to take out the solid carbon dioxide. He also admitted that in pressing the blocks there was a big evolution of gas. It also eliminated moisture being entrained in the solid carbon dioxide during the removal from the chamber in which the carbon dioxide was formed to where it was pressed. This varied on damp days and depended upon the humidity in the air [I. 152]. It also eliminated all variations in the density of the solid block of carbon dioxide and enabled a dense block to be produced which had a density of 1.5 [I. 157] as compared to a density of 1.2 produced in the commercial structures being used. This resulted in the blocks being capable of being shipped to distant points whereas the blocks produced in the prior art could only be shipped within narrow limits [I. 155]. The use of the vertical

apparatus of Fig. 5 in producing solid blocks of carbon dioxide also resulted in lower labor costs. The labor costs for actual press labor and making the solid blocks approximated \$7.00 a ton in the commercial structures used before Cole and McLaren. With the advent of this invention, these labor costs were reduced to \$1.25 a ton, a very appreciable saving per ton. This saving is appreciable when it is considered that the average present price of carbon dioxide is approximately \$40.00 a ton [I. 254].

If there is any remaining doubt in the court's mind upon the question of invention after considering the contribution to the art of the invention of the claims in issue, and with the resultant elimination of all of the disadvantages of the prior commercial structures, then this court should resolve the question of invention in favor of the patent because of its prompt acceptance by the industry, its continuous use without change and the commercial success it has obtained. Subsequent to its initial operation in the fall of 1928, the vertical apparatus of Fig. 5 went into commercial production. Dr. Jones recognized that only in this apparatus could a product be made for shipment to distant points [I. 168]. Within a period of three years ninety percent of the industry was using the vertical press of Fig. 5. The Cole and McLaren presses have entirely supplanted all other apparatus for the manufacture of solid blocks of carbon dioxide [I. 313]. The manufacturers, including the manufacturers of the H.P.M. and Frick presses used by appellees, manufacture this vertical type of apparatus [I. 313]. The vertical press of Cole

and McLaren has not been changed in any substance in construction since its initial operation in the fall of 1929, at which time it was successful from its first operation [I. 371].

The value of the vertical press of Fig. 5 and its contribution to the industry was recognized by the largest manufacturers of solid carbon dioxide by the taking of a license under the patent application covering said invention and under the patent issued thereon. The largest manufacturers of solid carbon dioxide in the United States all paid tribute to this invention [I. 344]. The apparatus used by said licensees is apparatus corresponding to Fig. 5 of the patent in suit [I. 345]. The plants operated by these licensees are scattered over the United States [I. 347]. The appellant is not a manufacturing concern and its revenues are obtained solely from the substantial royalties which are paid by the licensees.

We have previously in our statement of the case described the operations of the snow tank, the invention of the witness Martin. All of these snow tanks have completely disappeared from the market and in the plant which was built by the Dry Ice Corporation in the year 1928 all of the twelve snow tanks therein were replaced with Cole and McLaren vertical presses in the spring of 1929 [III. 1080]. It is not just chance that an apparatus should come into an industry and within a short period of time replace all previous types of apparatus and, in addition, should continue to displace all types of apparatus up to the present time and should be used with-

out material change by the largest manufacturers of carbon dioxide in the United States. The appellees have recognized this contribution to the art by adopting the vertical machine for operation in their plant at Niland. This vertical apparatus would not have been so adopted and used if it had not contributed to the carbon dioxide art. We have previously pointed out that it overcame all the disadvantages of the previous commercial structures.

That the factors of prompt acceptance in the industry, continuous use and commercial success, should be considered on the question of invention has long been recognized. In *Minerals Separation v. Hyde*, 61 L. ed. 287, at 293, 242 US 261, the court in its opinion said:

“The record shows not only that the process in suit was promptly considered by the patentees as an original and important discovery, but that it was immediately generally accepted as so great an advance over any process known before that, without puffing or other business exploitation, it promptly came into extensive use for the concentration of ores in most, if not all, of the principal mining countries of the world, notably in the United States, Australia, Sweden, Chile, and Cuba, and that, because of its economy and simplicity, it has largely replaced all earlier processes. This, of itself, is persuasive evidence of that invention which it is the purpose of the patent laws to reward and protect. (Citing cases.)”

The Supreme Court again stated in *Potts v. Craeger*, *supra*, at 280:

“As we said in *Smith v. Goodyear Dental Vulcanite Co. supra*, and *Magowan v. New York Belting & P.*

Co., 141 U. S. 332, 343 (35: 781, 785), where the question of novelty is in doubt, the fact that the device has gone into general use, and displaced other devices employed for a similar purpose, is sufficient to turn the scale in favor of the invention. Our conclusion is that the patents in question are valid."

This court has applied this principle of law in sustaining numerous patents. In *Morton v. Llewellyn*, 164 F. 693, at 697, this court stated:

"We find no contradiction of this testimony in the record. Apart from the presumption of novelty that always attends the grant of a patent, the law is that where it is shown that a patented device has gone into general use, and has superseded prior devices having the same purpose, it is sufficient evidence of invention in a doubtful case. The Barbed Wire Patent, 143 U. S. 275, 292, 12 Sup. Ct. 443, 36 L. Ed. 154; Keystone Manufacturing Company v. Adams, 151 U. S. 139, 143, 14 Sup. Ct. 295, 38 L. Ed. 103; Irwin v. Hasselman, 97 Fed. 964, 38 C. C. A. 587; Wilkins Shoe Button Co. v. Webb (C. C.) 89 Fed. 982; National Hollow B. B. Co. v. Interchangeable B. B. Co., 106 Fed. 693, 707, 45 C. C. A. 544."

In *Union Tool Co. v. Wilson & Willard Mfg. Co.*, 237 F. 837, at 839, this court cited *Morton v. Llewellyn* with approval, stating:

"It is clear that much of the credit for this great accomplishment is unquestionably due to the Double underreamer. It almost at once took the lead in the oil well tool trade over all former reamers. There is testimony that, in the California fields, 85 per cent. of the underreamers sold are either of the Double type or that of the alleged infringing device. These

facts, coupled with the presumption arising upon the grant of the patent, are sufficient to resolve any doubt, which may exist in this case, in favor of the validity of the patent. *Stebler v. Riverside Heights Orange Growers' Association*, 205 Fed. 735, 124 C. C. A. 29; *Morton v. Llewellyn*, 164 Fed. 693, 90 C. C. A. 514."

See also:

Wahl Clipper Corp. v. Andis Clipper Co., 66 F. 2d 162, at 165;

Benjamin Electric Mfg. Co. v. Northwestern Electric E. Co., 251 F. 288, at 294.

The error of the trial court in Finding 20 in failing to consider the invention as a combination of elements and the additional error of the trial court in Finding 16 in holding that the horizontal machine of Fig. 2 contained the same elements and had the same mode of operation as the vertical apparatus of Fig. 5, together with the failure of the court to appreciate the fact that the vertical apparatus of Fig. 5 had made a great contribution to the carbon dioxide industry and had achieved remarkable commercial success, caused the lower court to fall into the error of holding that the combination of elements of the claims in issue and the steps of the method claims did not constitute invention. The evidence does not support said Findings and if the trial court had considered said evidence in the light of the foregoing cases it could only have arrived at the conclusion that the Cole and McLaren invention, although simple in character, was such an advance in the art as to warrant a holding of validity.

The Patent in Suit Is Not Invalid for Failure to
Comply With the Requirements of
(35 USC 33) R.S. 4888.

The trial court in Finding 21 [I. 76] found that the claims in issue were vague and indefinite as to some of the factors controlling the construction and operation of the apparatus and the performance of the method and also found that controlling factors and details were omitted from the specifications. Conclusion of Law 5 [I. 82] based thereon held said claims to be invalid. The court did not find any specific elements or factors which were omitted from either the apparatus or method claims.

The lower court in the second paragraph of Finding 21 found that certain specific elements, *i. e.* the double jacket construction shown in Fig. 5, the separating members shown in Figs. 7 and 8 of the drawings, the exhauster 81 and the diaphragm valve 84 as shown in Fig. 1 of the drawings, were not included in the claims. These elements are disclosed in the specifications and drawings. The lower court could not possibly have been referring to these specific elements as the controlling factors and elements which were omitted from the claims because the court, in addition, found that the controlling factors which were omitted were not in the specifications. Finding 21, therefore, is of no assistance to this court in determining the elements and factors which the court finds to be omitted from the claims and specifications and which are necessary for the construction and operation of the apparatus and the performance of the method.

The apparatus claims in issue, for example claim 34, are directed to the vertical apparatus of Fig. 5. Each and every element of said claim is disclosed in the speci-

fications and drawings of the patent in suit. The contribution of the inventors to the art, that is the vertically disposed apparatus as shown in Fig. 5, wherein solid carbon dioxide is formed in the same chamber where it is pressed and without contact from the air and with hydraulically operated means to press the carbon dioxide into dense solid blocks and thereafter remove the same from the chamber, is covered by said claim. The provisions of §33 do not require any more certainty.

In operating the vertical apparatus of Fig. 5, as covered by the claims in issue for the forming of solid carbon dioxide and thereafter pressing the same into blocks, it is not necessary that the specifications describe or the claims include the operations for forming solid carbon dioxide and thereafter pressing it into blocks which were known in the art. If the lower court referred to such factors and elements, they were admittedly found to be old in the art in Finding 23. This Finding included as well known in the art the snow method and triple point method of forming solid carbon dioxide. It also included knowledge of the proper thickness of the walls of the apparatus, the volume of the gas introduced into the chamber, the relative sizes of the inlets and outlets and the use of the proper types of nozzles. All of these factors or elements are well known in the art as specifically found in Finding 23.

If the lower court was referring to the factors and elements covered in the testimony of Prof. Clapp [II. 771-774], then such elements and factors are either included in Finding 23 as being well known in the art or shown to be well known in the art by the testimony of Dr. Jones [III. 1103-1112]. There is no testimony by Prof. Clapp

or elsewhere in the record that any factor or element necessary to the construction or operation of the apparatus covered by the claims in issue was not known to a man skilled in the art. Dr. Jones on the contrary testified [III. 1103-1112] that all the factors and elements specified by Prof. Clapp were old in the art prior to the invention of the patent in suit and were known to a man skilled in said art.

Title 35 USC §33 [R.S. 4888], in requiring sufficiency of disclosure in the specifications and definiteness of the claims, specifically states as a part thereof that a patent is addressed to a man skilled in the art to which the patent is directed. That such is the law is stated in *Mowry v. Whitney*, 20 L. ed. 860, at 863, 81 US 620, wherein the Supreme Court said:

“The specification, then, is to be addressed to those skilled in the art, and is to be comprehensible by them. It may be sufficient, though the unskilled may not be able to gather from it how to use the invention. And it is evident that the definiteness of a specification must vary with the nature of its subject. Addressed as it is to those skilled in the art, it may leave something to their skill in applying the invention, but it should not mislead them.”

In *Carnegie Steel Co. v. Cambria Iron Co.*, 46 L. ed. 969, at 986, 185 US 403, at 437, the Supreme Court again stated:

“The specification of the patent is not addressed to lawyers, or even to the public generally, but to the manufacturers of steel; and any description which is sufficient to apprise them in the language of the art of the definite feature of the invention, and to

serve as a warning to others of what the patent claims as a monopoly, is sufficiently definite to sustain the patent.”

This court in *Fullerton W. G. Assn. v. Anderson-Barngrover Mfg. Co.*, 166 F. 443, at 449, 450, in sustaining the patent in suit, cited the *Carnegie Steel v. Cambria Iron Co.* case, *supra*, with approval in disposing of the contention that the specifications were indefinite or uncertain. See also to the same effect:

Thomas A. Edison, Inc. v. Waterbury Battery Co.,
281 F. 254, 257;

Goldschmidt Thermit Co. v. Primos Chemical Co.,
292 F. 362, at 369.

The same rule of law applies to the question of whether the claims are vague and indefinite as found in Finding 21. In *Trico Products Corp. v. Apco-Mossberg Corp.*, 45 F. 2d 594, at 599, the Circuit Court of Appeals for the First Circuit said:

“We do not think that it was necessary for the patentee to describe or claim as a part of his invention what was so commonly known in the art as the wiper arm, motor, and the degree of tension with which the wiping element contacted with the glass. That remained as before in the art.”

In *Lever Bros. Co. v. Proctor & Gamble Mfg. Co.*, 139 F. 2d 633, the Circuit Court of Appeals for the Fourth Circuit, in reversing the decision of the lower court in finding the patent in suit invalid, stated at 639:

“* * * It was not necessary or practicable for Clayton to specify the exact degree of emulsion breaking temperature or the precise length of time needed for the substantial neutralization of every

quality of oil that might be subjected to refinement; and the evidence shows that the information given was entirely adequate to persons skilled in the art. * * *

“ ‘There are many situations in the practice of the arts in which specific directions are properly omitted from the claims of patents because greater definition is either impracticable or is unnecessary to inform the art, and would serve only unduly to limit the scope of the invention or to invite evasion by those who desire wrongfully to misappropriate the substance of the invention.’ ”

See also:

Research & Development Corp. v. Chase, 88 F. 2d 353, at 355;

Doble Engineering Co. v. Leeds & Northrup Co., 134 F. 2d 78, at 85.

The contribution which the inventors made to the art by the patent in suit is not the factors and elements specified by Prof. Clapp [II. 771-774] and specifically found to be old in the art in Finding 23 and by the testimony of Dr. Jones [III. 1103-1113]. Said contribution resides and is disclosed in the vertical apparatus of Fig. 5 wherein solid carbon dioxide can be formed and pressed in the same chamber without contact with the air and by means which result in a dense block and with provisions for removing the block from the chamber. Such contribution is fully set forth in the claims in issue and the inclusion of elements well known in the art would necessarily limit the claim to such an extent that infringement would be invited. *Lever Bros. v. Procter & Gamble*, *supra*. The fact that the industry was, with its knowledge, able to immediately put the invention into extensive practice

is evidence that there was nothing lacking in the patent in suit. This evidence is to be considered in determining whether the claims fulfill the requirements of §33. In *Webster Loom Co. v. Higgins*, 26 L. ed. 1177, 105 US 580, in disposing of the question of indefiniteness of the specification and claims, the Supreme Court stated at 1180:

“A great deal of testimony was introduced by the defendants, to show that the patentee had failed to describe his invention in such full, clear and exact terms as to enable persons skilled in the art to construct and use it. It seems to us that the attempt has failed. When the question is, whether a thing can be done or not, it is always easy to find persons ready to show how not to do it. But it stands confessed that the thing has been done; that is to say, the contrivance which Webster claims in his patent has been applied and very successfully so, to pile fabric looms and, as the appellants’ counsel well remarks, no one except Webster has ever appeared to claim a patent for doing it. If the thing could not be understood without the exercise of inventive power, it is a little strange that it should have been so easily adapted to the looms on which it has been used and produced such striking results.”

Not only has the court failed to specify the factors and elements which it finds are omitted from the claims and specifications in Finding 21 but all factors and elements referred to in the record which might be used by the prior art in refinements of construction and operation are all well known to a man skilled in the art. The provisions of §33, therefore, have been fully complied with. In fact there is no evidence in the record to support said Finding, indefinite as it is.

The Claims in Issue Are Not Invalid for Aggregation.

The trial court in Finding 24 found that the elements and steps of the claims in issue pertaining to the solidification of the carbon dioxide were entirely independent of and were performed independently of the elements and steps of the apparatus for compressing the material and that they produced no new function or result. This Finding is not supported by the evidence and is not in accord with established law. It is not essential that there be a wholly new function or result in a combination claim. It is only essential if an old result is performed in a more economical or efficient way. See:

Galvin Elec. Mfg. Co. v. Emerson Elec. Mfg. Co.,
(CCA 8), 19 F. 2d 885, at 888;

Skinner Bros. Belting Co. v. Oil Well Imp. Co.,
(CCA 10), 54 F. 2d 896.

Admittedly solid carbon dioxide in the Martin snow tank method, for example, was formed in a chamber which was closed to the atmosphere. Admittedly pressing of the solid carbon dioxide by means of presses was done at another point after the carbon dioxide had been transmitted in the open atmosphere to the place of pressing. Admittedly solid carbon dioxide blocks were formed by pressing, which were sold in commerce. These facts, however, are not determinative of the question of aggregation. By forming the solid carbon dioxide in a chamber and thereafter pressing the solid carbon dioxide into dense blocks in the same chamber and without disturbing the position of the solid carbon dioxide, and without contact from the atmosphere, a block of solid carbon dioxide was obtained which was a better commercial product.

That such is a fact is established by the industry universally using the vertical apparatus of Fig. 5 to form such a block, which eliminated the loss of volume, cracking and shattering of the blocks which was inherent in the previous commercial product.

When elements are so united by their reciprocal influence upon each other they perform additional functions and accomplish additional results, the union is a true combination. The Tenth Circuit in *Independent Oil Well Cementing Co. v. Halliburton*, 54 F. 2d 900 so held at page 905 in disposing of the contention by the defendant in that case that the claims in suit were for a mere aggregation and not a patentable combination.

To the same effect see:

Stutz v. Armstrong, 20 F. 843;

United States Hoffman Machinery Corp. v. Pantex Pressing Mach., Inc., 35 F. 2d 523, at 525.

It is not necessary that the action of the elements be simultaneous.

Independent Coal Tar Co. v. Cressy Contracting Co. (CCA 1), 260 F. 463, at 468.

Furthermore, it is not objectionable upon the ground of aggregation that the joint action which produces the unitary result of the apparatus comes through the mediation of the operator or through the operating force. Admittedly in the operation of the apparatus of the claims in issue it is necessary to manipulate valves and to actuate the pressing mechanism.

Dudlo Mfg. Co. v. Varley Duplex Magnet Co. (CCA 7), 253 F. 745;

Krell Auto Grand Piano Co. v. Story & Clark Co., 207 F. 946.

The distinction between a combination and an aggregation is very well stated in *Robinson on Patents*, Vol. I, §§154, 155, 156, wherein the author states:

“Where operations or instruments are * * * united, one of two results must follow. Either each element remains unchanged in function and effect; or by the action of the elements upon each other, or their joint action on their common object, they perform additional functions and accomplish additional effects. The former union is a mere collocation or aggregation of the elements. Although they have been brought together in an apparent organism and rendered more available for use, they still remain the same distinct and independent means, still acting as so many separate units and not co-operating with each other to perform additional functions and accomplish additional results. Such unions, therefore, are not the creation of new means. They do not involve an exercise of the inventive faculties, nor can they be protected by a patent.

“But when these elements are so united that by their reciprocal influence upon each other, or their joint action on their common object, they perform additional functions and accomplish additional results, the union is a true combination. While every element remains a unit, retaining its own individuality and identity as a complete and operative means, their combination embodies an entirely new idea of means, and thus becomes another unit, whose essential attributes depend on the co-operative union of the elements of which it is composed. Such a combination is a different invention from the elements themselves, whether considered in their separate or their aggregated state, the method of their co-operation in the combination being the result of the inventive act. Whether the elements are new or old, and whether

they coact successively or simultaneously is of no importance. To unit them in a new means by the exercise of inventive skill is invention, and renders the combination, as an entirety, the subject-matter of a patent.

“This union of elemental instruments or operations in a new operation or instrument must necessarily produce effects beyond the sum of the effects producible by all the elements in their separated state. This is often the only test by which a combination can be distinguished from an aggregation, and is the one usually applied by the courts. And it is certainly reliable. For since diversity of end necessitates diversity of means, if the new combination accomplishes results that could not have been achieved either by its individual or collective elements, their union must inevitably have brought into action some new or as yet unawakened energy, which constitutes a new and independent means.”

Referring to the apparatus claims in issue, they cover a new combination of elements wherein in a vertical chamber, closed to the atmosphere, solid carbon dioxide is formed and deposited and thereafter vertically pressed into dense blocks without displacement from initially deposited location in the vertical chamber, with means shown to introduce the liquid carbon dioxide for expansion in the chamber and to allow the escape of gas formed in the chamber and means also specifically disclosed, consisting of vertically reciprocal hydraulic rams whereby the deposited solid carbon dioxide may be vertically pressed into dense blocks and thereafter removed from the chamber. In this operation there is no contact of the deposited mass of solid carbon dioxide or of the block vertically pressed therefrom during pressing, with the at-

mosphere, which is a result not obtained in any prior art structure; there is a vertical pressing of the deposited mass of solid carbon dioxide in the same chamber in which the mass is formed without moving the mass from the chamber where it was formed or from its initially deposited location in such chamber; there is no moving or handling of the solid carbon dioxide prior to pressing, which was not done in any prior art structure. The solid carbon dioxide and the dense block being formed in the same chamber are not subject to a variation in temperature which might affect the quality or structural character of the resulting block. Later costs were materially reduced in the forming and pressing operations as compared to the commercial operations in use at the time of the invention of the patent in suit. These results were only obtained because of the fact that the operations were performed in the vertical apparatus of Fig. 5. It is the coacting of the elements of the vertical apparatus of Fig. 5 and their joint action on their common object, namely the solid carbon dioxide, that causes these results and obtains a dense block of solid carbon dioxide of uniform character throughout the block which, by its acceptance in the industry, has proved it to be commercially satisfactory for storage and commercial handling and for transportation to distant points. There is no aggregation in the law when elements coact to produce such new results and also result in a more economical and efficient manufacture of solid carbon dioxide.

Ohmer Fare Register Co. v. Ohmer (CCA 6), 238 F. 182 at 190;

National Cash Register Co. v. American Cash Register Co. (CCA 3), 53 F. 367, at 371;

Independent Oil Well Cementing Co. v. Halliburton, 54 F. 2d 900, at 906.

The error of the court in Finding 24 was in failing to appreciate that the combination of elements of the apparatus claims in issue and the steps of the method claims produced new results and also resulted in more economical and efficient operations in the manufacture of solid blocks of carbon dioxide. This error was at the base of the court's error in considering the question of invention.

**The Claims in Issue Are Infringed by the H.P.M.
and Frick Presses Operated by Appellees.**

The appellees in their operations at Niland, California, admittedly operated vertical presses for the manufacture of solid blocks of carbon dioxide. The Frick press is shown in the drawing of plaintiffs' Ex. 3 [IV. 1327] and the H.P.M. press is shown in the drawing of plaintiffs' Ex. 4 [IV. 1328]. These drawings were supplied by the appellees as showing the construction of the presses operated at Niland. The Frick press of Ex. 3 as operated is substantially the same as the press admittedly operated by the appellees [I. 387]. The H.P.M. press of Ex. 4 admittedly correctly shows the H.P.M. press operated by appellees at Niland [I. 398]. The Frick and H.P.M. presses admittedly are mechanically the same and have the same function [I. 413]. The only difference is that the Frick press is an inverted press wherein the solid carbon dioxide is taken out of the press at the top, whereas the H.P.M. press is the ordinary type of vertical press wherein the block is removed at the bottom of the chamber.

The Frick and H.P.M. presses include every element of the claims in issue, as can be readily seen by a comparison. Referring to plaintiffs' Ex. 4, and comparing the

elements with the elements of claim 34, we see that the apparatus is a gas solidifying and pressing apparatus for the manufacture of solid blocks of carbon dioxide. It has a vertically disposed closed top and bottom gas solidifying and pressing chamber. It has a vertically disposed fluid pressure cylinder below the chamber, with a vertical reciprocal plunger therein. It has a chamber closing head mounted on the upper end of the pressure cylinder and vertically movable therewith between raised position closing the open bottom of the chamber and sealing the chamber from the atmosphere. In fact there is a notation on plaintiffs' Ex. 4 that there are sealing rings on the lower ram to insure that there will be no contact with the atmosphere. The lowering of the lower ram opens the bottom of the chamber. There is included an upper pressing plunger or ram vertically reciprocal in said chamber for pressing the solidified carbon dioxide into a block against the bottom ram when the bottom ram is in raised chamber-closing position. The rams are operated by hydraulic means. Admittedly there is means for supplying the carbon dioxide in fluid form to the chamber for expansion to convert a portion thereof to a solid and a portion to a gas when the lower ram is in a chamber sealing position and the pressing plunger is in a raised inactive position in the chamber. There is in addition means for withdrawing the gas from the chamber during the formation of the solid carbon dioxide and the closing head, upon completion of the pressing of the block, is movable downwardly for the removal of the block from the chamber.

Each and every element of claim 34, which is a typical claim, is admittedly present in the H.P.M. press shown in Ex. 4 and which was in commercial operations by the appellees.

Subsequent to the supplying by appellees of the drawings Exs. 3 and 4, the appellees sought to correct the drawings by showing on each of said presses a vent to atmosphere. This consisted of a pipe one inch or one and a quarter inch in diameter [II. 440] which extends outwardly and upwardly for a distance of about six feet to the top of the hydraulic chamber. Although these vents to atmosphere were evidently not of sufficient importance in the operation of the press to be included on the drawings when furnished to the appellant, nevertheless the use of these vents is the only manner in which the appellees endeavor to escape infringement of the apparatus claims in issue.

Earl P. Wells, a witness called on behalf of the appellees, described the operations of the Frick and H.P.M. presses operated by appellees by reference to Ex. I [IV. 1367] [I. 401-413]. His explanation of the operation of the vertical apparatus shown in said exhibit for the manufacture of solid blocks of carbon dioxide covers both the H.P.M. and Frick presses with the exception that in Fig. 2 of said exhibit the liquid inlet valve would be closed after the required amount of liquid carbon dioxide was admitted into the chamber. In the operation of the snow method the inlet valve of Fig. 2 would be open during the entire time that the solid carbon dioxide was being formed in the chamber.

Realizing that their Frick and H.P.M. presses operated by the appellees were substantially the vertical presses of Fig. 5 as covered by the claims in issue, the appellees, subsequent to furnishing the drawings Exs. 3 and 4, belatedly sought to make capital upon the question of infringement of the fact that during a portion of the opera-

tion of the presses some of the gas was vented to atmosphere instead of being returned to the gas supplying system. Admittedly the purpose of venting the gas to atmosphere during the final operations of the press was to speed up production so that it would not be necessary for the compressor to remove the last 5 or 10 pounds of gas in the chamber [I. 417]. This vent to atmosphere was not opened when the solid carbon dioxide was being formed in the chamber and it was not opened until substantially all of the gas had been drawn from the chamber into the compressor system and when the pressure in the chamber had reached approximately 5# [I. 400]. At that time, the witness Wells testified, the vent to air shown on Ex. I was opened and the blown out or compressor line was closed. The chamber during all this period of operation was closed to the atmosphere by the lower platen which was a mortise and tenon metallic joint which was substantially tight when it was clean and new [I. 405]. Although there was some escape of gas around the lower platen, the purpose of the lower platen with its sealing rings was to obtain substantial tightness [II. 449] and in order to get a good seal the operator occasionally wiped the lower platen off with a cloth [II. 451] to remove any chunks of water-ice which might be thereon. Furthermore, the seals were changed from time to time and as soon as they showed any appreciable wear.

That the vent to atmosphere did not result in air entering the chamber and interfering with the pressing operations is clearly shown by the evidence. Wells testified

that when the pressure reached 5# and the vent was opened that the blow out valve to the compressor was closed. When asked the purpose of closing the valve he stated [II. 439]:

“To prevent air from entering the vent line and getting into the compressor.”

Dr. Jones testified [III. 1078, 1115] that gases are given off during all of the pressing operations and that no air can get into the chamber during that period because the gas escaping from the vent prevents the admission of air. Dr. Jones further testified [III. 1079] that during this pressing period that air would not enter the chamber through a normal size vent to atmosphere. Upon cross-examination he stated that a normal size vent would be two inches or smaller in diameter [III. 1153]. Admittedly the vent pipes used and operated by appellees are one inch to one and a quarter inches in diameter. There is no testimony in the record to contradict this testimony of Dr. Jones.

The lower court in Finding 30 [I. 81] also found that one of the platens of the H.P.M. and Frick presses was moved prior to the pressing operation so that carbon dioxide gas might pass around the platen and into the atmosphere. The witness Wells testified [I. 406] that the platen was moved into the position shown in Fig. 4 of Ex. I [IV. 1367] and so that the platen was slightly above the bottom of the chamber and that the purpose of moving the platen was:

“* * * to also release any gas that may be under the block or under the pile of snow.”

The witness further testified:

“Yes, there is a large visible rush of gas out of there.”

The appellee, W. L. Benson, testified [III. 1050]:

“Q. Gas would escape; was that the reason why it was cracked, so gas would escape if there was any in there?

“A. That is the purpose.”

In the admitted operation of the H.P.M. and Frick presses the platen is not lowered so that air can enter the chamber. It is only lowered in order to enable gas to escape. There is no testimony in the record that any air ever entered the chamber and came into contact with the solid carbon dioxide around the platen. On the contrary Wells testified [II. 441] that after the pressure in the chamber had been dropped to approximately 5# and the vent to the air opened that thereafter the air valve on the vent line was closed when the platen was lowered to remove the solid block of carbon dioxide. When asked what was the purpose of closing the air valve on the vent line, the witness testified:

“A. It is to prevent the inlet of air, moist air, when the platen is dropped, and it also permits a little accumulation of gas above the ice block, which helps to push it down onto the lower platen for removal. It is also preparatory to starting the next cycle.”

The lower court in Finding of Fact 30 does not find that any air enters the pressing chamber during the forming of the solid carbon dioxide or the pressing operation nor does the court find that any air enters the chamber during any of said operations around the platens when

the same are moved slightly to allow the escape of gas. There is no testimony in the record to support any such Findings. The file wrapper of the Cole and McLaren patent (Dfts. Ex. PP) discloses that in paper No. 5 filed in the Patent Office on February 12, 1929, the claims then in the patent were amended to include a closed chamber in view of the citation by the Patent Office of Elworthy patent 579,866, corresponding to the British Elworthy patent cited as a reference in this action and which is in the book of exhibits as defendants' Ex. EE-27 [IV. 1539]. This Elworthy patent showed a structure in which the forming of the solid carbon dioxide took place in one chamber and the pressing operation took place in another chamber below the forming chamber and with the bottom of the forming chamber being exposed to the air so that air could enter the chamber; the Elworthy patent in this respect being similar to the snow tank operation wherein the solid carbon dioxide was removed from the forming chamber, exposed to the atmosphere and thereafter pressed into blocks. The sole purpose for amending the claims and using the phrase "closed chamber" was to distinguish from the Elworthy patent and other structures in the prior art wherein the apparatus was so constructed that air could readily enter the chamber. The vent pipe used by appellees, when substantially all of the gas has been exhausted from the chamber, does not function to allow air to enter the chamber and to contact the solid carbon dioxide. The moving of the platen to allow gas to escape around the platen does not function to allow air to enter the chamber or to contact the solid carbon dioxide. The interpretation which the lower court gave the apparatus claims in issue in finding noninfringement in Conclusion of Law 13 [I. 84] gives an interpretation to the words "closed" and "sealed" which is not imposed by the Patent

Office actions or by the prior art and which prevents the appellant from enjoying the fruits of the invention covered by said apparatus claims. It is not the province of any court to give an interpretation to a claim which is not justified by the prior art or the proceedings in the Patent Office which would prevent the patentees from securing the monopoly to which they are entitled. The exhaustor and diaphragm valve referred to in Finding 30 are not elements of the apparatus claims in issue and the fact that the H.P.M. and Frick presses do not employ an exhaustor or a diaphragm valve is immaterial upon the question of infringement of the apparatus claims. Other claims of the patent in suit not in issue in this case are directed to combinations of elements, including these particular elements. This court in *Reinharts, Inc., v. Caterpillar Tractor Co.*, 85 F. 2d 628, at 633, in determining the question of infringement, stated:

“The combinations in suit do not contain that element, but contain a different element, namely, ‘a rear driving axle.’ These combinations are not to be limited by writing into them an element contained in combinations not in suit. *Los Angeles Art Organ Co. v. AEolian Co.* (C. C. A. 9.), 143 F. 880, 885.”

The fact that the inventors of the patent in suit did not appreciate or realize at the time that the invention was made that the vertical apparatus of Fig. 5 could be utilized in the manufacture of solid carbon dioxide by the triple point method is immaterial. It is fundamental that the claims in issue are entitled to all uses to which they may be applied. This court in *Reinharts, Inc., v. Caterpillar Tractor Co.*, at p. 632, so held, stating:

“The claims cannot be so limited. Although, as the specification indicates, the patented attachment

was intended to be used in converting trucks into tractors, such intended use does not measure the patentee's right. He did not limit his invention to that particular use. He may, therefore, claim every use to which it may be applied, irrespective of whether he had it in mind when he made the invention. *Western Electric Co. v. La Rue*, 139 U. S. 601, 606, 11 S. Ct. 670, 35 L. Ed. 294; *Deitel v. La Minuette Trading Co.* (C. C. A. 2), 37 F. (2d) 41, 42; *Dwight & Lloyd Sintering Co. v. Greenawalt* (C. C. A. 2), 27 F. (2d) 823, 828."

The test of infringement of apparatus claims is whether the claimed infringing structure performs substantially the same function in substantially the same way to obtain the same result.

Burr v. Duryee, 17 L. ed. 650, at 658, 1 Wall. 531, at 573.

The Supreme Court of the United States in *Sanitary Refrigerator Co. v. Winters*, 74 L. ed. 147, 280 US 30, in sustaining the validity and infringement of the patent there involved, cited *Burr v. Duryee* with approval at p. 156, stating:

"There is a substantial identity, constituting infringement, where a device is a copy of the thing described by the patentee, 'either without variation, or with such variations as are consistent with its being in substance the same thing.' *Burr v. Duryee*, 1 Wall. 531, 573, 17 L. ed. 650, 658. Except where form is of the essence of the invention, it has little weight in the decision of such an issue; and, generally speaking, one device is an infringement of another, 'if it performs substantially the same function in substantially the same way to obtain the same result.

. . . Authorities concur that the substantial equivalent of a thing, in the sense of the patent law, is the same as the thing itself; so that if two devices do the same work in substantially the same way, and accomplish substantially the same result, they are the same, even though they differ in name, form or shape.' Union Paper-Bag Mach. Co. v. Murphy, 97 U. S. 120, 125, 24 L. ed. 935, 936. And see Elizabeth v. American Nicholson Pavement Co., 97 U. S. 126, 137, 24 L. ed. 1000, 1005. That mere colorable departures from the patented device do not avoid infringement, see McCormick v. Talcott, 20 How. 402, 405, 15 L. ed. 930, 931. A close copy which seeks to use the substance of the invention, and, although showing some change in form and position, uses substantially the same devices, performing precisely the same offices with no change in principle, constitutes an infringement. Ives v. Hamilton, 92 U. S. 426, 430, 23 L. ed. 494, 495. And even where, in view of the state of the art, the invention must be restricted to the form shown and described by the patentee and cannot be extended to embrace a new form which is a substantial departure therefrom, it is nevertheless infringed by a device in which there is no substantial departure from the description in the patent, but a mere colorable departure therefrom."

See also:

McDonough v. Johnson-Wentworth Co., 30 F. 2d 375, at 383;

Williams Iron Works v. Hughes Tool Co., 109 F. 2d 500;

Hyman v. F. W. Woolworth Co., 28 F. 2d 833.

The structural elements of the claims in issue, for example claim 34, are identically the same as the structural

elements in the H.P.M. and Frick presses. The result obtained is the same, that is the manufacture of solid blocks of dense carbon dioxide for commercial purposes. The mode of operation in forming the solid carbon dioxide, in exhausting the gas, in pressing the solid carbon dioxide into blocks in the same chamber without contact with the atmosphere and thereafter opening the chamber to remove the blocks, is the same mode of operation used by appellees. The fact that in exhausting some of the gas to the atmosphere there may be a slight impairment of efficiency of the operation is immaterial. It is merely a colorable departure from the invention and such colorable departure does not avoid infringement.

Sanitary Refrigerator Co. v. Winters, supra.

This court had no difficulty in determining the question of infringement in *Stebler v. Riverside Heights Orange Growers' Assn., supra*. In said case the defendants endeavored to avoid infringement by giving a strained construction to a phrase in the claim in issue. In disposing of said contention, the court stated at p. 740:

“Defendants appear to attach great importance to the phrase ‘end to end,’ as used in claim 10, as a limitation upon the grant expressed in plaintiff’s letters patent; but we are unable to yield to the construction contended for, which seems to us to be strained and unnecessarily strict. Surely by ‘end to end’ the patentee could not have intended unbroken continuity of roller axes, or perfect contiguity of roller ends. Such a structure would in one aspect be wholly incompatible with the idea of independent, transverse adjustability, and, in another, mechanically impossible. The necessary adjustment of the rollers for any practical work unavoidably breaks the axis continuity of the series, and there must be some degree of longitudinal

end separation to give room for the mounting or bearing brackets. Who shall say, then, to what extent the rollers may be out of line or longitudinally separated, and still be 'end to end'? Or who shall say how close together the rollers in defendants' device may be, and not be 'end to end'? May the latter be separated by a guide two or four inches in length, and still escape this characterization? The questions serve to emphasize the reasonableness, if not the necessity, of construing the phrase as the expression only of an intention to include and claim the longitudinal arrangement of a series of rollers, and to differentiate and disclaim other combinations, such as, for instance, that in the Hutchins invention, where the rollers are arranged parallel to each other and one above the other. This we believe to be a fair construction of the language, and it is therefore adopted."

The construction which the lower court gave to the words "closed from the atmosphere" and "sealed from the atmosphere" in the claims in issue is as strained as the construction which the defendants endeavored to give the words "end to end" in *Stebler v. Riverside Heights Orange Growers' Assn.*, *supra*. Infringement cannot be so avoided and even though this court may hold that the claims in issue are restricted to the language thereof, nevertheless there should be a liberal interpretation of words in order to sustain the invention. See:

Nachman Spring-Filled Corp. v. Kay Mfg. Co.,
139 F. 2d 781.

The lower court clearly erred in concluding from Finding 30 that the apparatus claims in issue were not infringed because the chamber in which the pressing and forming operations occurred was not a closed or sealed

chamber because of the use of the vent pipe which allowed the gas to escape to the atmosphere instead of being returned to the compressor system and with no evidence in the record that air entered through said pipe. The court also erred in finding that the moving of the platen prevented the chamber from being a closed or sealed chamber. The evidence is clear that the purpose of moving the platen was to allow the escape of gas. There is no evidence that air entered around the platen into the chamber. That such an interpretation should not be given to the claims in issue is shown by the fact that the patent in suit discloses in Fig. 5 a vent 51^a which Dr. Jones testified was a vent which connected the pressing chamber to atmospheric pressure.

The lower court also found that the method claims in issue were not infringed. In Finding 30 the court found that there was no attempt made in the H.P.M. and Frick presses to maintain a constant pressure in the solidification chamber and, in addition, found that in the triple point operations of the appellees the supply of liquid carbon dioxide was shut off prior to the desired mass having been collected in the forming chamber. The court concluded from these findings that there was no infringement of the method claims in issue.

The witness Wells in testifying as to appellees' operation of the H.P.M. and Frick presses stated [II. 497] that the presses were used from 1940 up to the time of trial for producing solid blocks of carbon dioxide. He further testified [II. 432] that solid carbon dioxide was manufactured by the appellees by using both the triple point and snow methods. That it was the custom to make triple point ice in the summer time when the customers were less critical and to use the snow method in the winter time which gave a better quality of solid carbon dioxide. The

witness produced a graph or chart (Dfts. Ex. J) [IV. 1368] and testified that the graph shown thereon disclosed operations which he had seen at appellees' plant. For example, line 4^a of Ex. J represents an operation at appellees' plant which took place on October 4, 1942 [II. 484]. This was an operation by the snow method wherein the supply of liquid carbon dioxide was not shut off until there had been the required amount of solid carbon dioxide in the chamber. Curve 3 on Ex. J represents an operation taking place in April, 1944 [II. 483], which was also made by the snow method. The witness Wells testified that all of these operations were made by the operators without any instructions being given as to what pressures would be used in the chamber [II. 495]. These operations therefore represent commercial operations of the appellees. The description given by the witness Wells of the operation of appellees' presses in connection with Ex. I [IV. 1367] in the manufacture of solid carbon dioxide by the snow method reads directly upon method claim 38. Said claim does not include the step of operating the exhaustor or diaphragm valve referred to in Finding 30. The term "closed" is used in the same sense that it is used in the apparatus claims and infringement cannot be avoided by contending that the chamber is not closed because of the vent to air or escape of gas around the platens.

Claim 38 does provide that the supply of liquefied gas shall be shut off after a desired mass of the solid has been accumulated in the chamber. This admittedly is not done in the triple point operation because the liquid in the chamber becomes a solid only after the inlet valve is

closed. However, the triple point method was well known in the art and it was obvious from the triple point operation that the inlet valve would be closed prior to solid carbon dioxide being formed in the chamber. The variation in the method is merely the use of a well known equivalent of obtaining solid carbon dioxide in the chamber and does not avoid infringement.

Tilghman v. Proctor, 102 US 707, 26 L. ed. 279;

Celite Corp. v. Dicalite Corp., 96 F. 2d 242 (CCA 9).

Appellees seek to avoid infringement of method claim 39 by contending that a definite pressure is not maintained in the closed chamber during the formation and collection of the solid carbon dioxide therein. In the apparatus of Fig. 5, with its accompanying compressor system, a definite pressure is maintained by the exhaustor 81 and diaphragm valve 84. The appellees admittedly do not use an exhaustor or diaphragm valve but in the triple point method they maintain a definite pressure during the formation and collection of the solid carbon dioxide which is above 60.4# pressure in the chamber. If such a pressure were not maintained, solid carbon dioxide could not be formed in the chamber by the use of the triple point method. In the use of the snow method, a pressure below 60.4# is used in the chamber in the forming and collection of the solid carbon dioxide therein. All of the other steps of method claim 39 are used in the production of solid carbon dioxide by appellees and are so described by the witness Wells in explaining the operation of appellees' presses, particularly with reference to Ex. I [I. 401-413].

In determining infringement of method claims, the question of infringement is entirely independent of the particular apparatus used by the appellees. *Petroleum Rectifying Co. v. Reward Oil Co.*, 260 F. 177, at 182 (CCA 9):

“* * * If, as we have found, the appellee uses the appellant’s process it is immaterial that, by improvements in structure of its apparatus, the appellee has so increased the efficiency of its machine that it marks a distinct improvement upon the appellant’s apparatus.”

It would, therefore, be immaterial in determining the question of infringement of the method claims whether the apparatus used by appellees was the same or different from the vertical apparatus of Fig. 5. In the instant case the Frick and H.P.M. presses are substantial copies of the vertical apparatus of Fig. 5. Furthermore, the infringement of a method patent is not avoided by varying the details of the apparatus by which use is made of it. See:

Smith v. Snow, 79 L. ed. at 732.

The appellee, Natural Carbonic Products, Inc., admittedly operated the plant at Niland by the use of the H.P.M. and Frick presses from sometime in the year 1940 to about July 1, 1943. Said corporation is responsible for the operations during that period of time. The appellee, George Pepperdine Foundation, admitted [I. 40] that it was the owner of approximately sixty-five percent of the issued stock of Natural Carbonic Products, Inc. It further admitted [I. 41] that it acquired all the assets of the defendant corporation and as a result thereof Natural Carbonic Products, Inc., was dissolved. The

appellee, George Pepperdine Foundation, owning the property at Niland, including the Frick and H.P.M. presses, leased the same on or about July 1, 1943, to the appellee, L. H. Polderman, who thereafter formed a partnership with the appellees, W. L. Benson and C. B. Benson, to operate said presses [I. 27]. It is admitted [I. 27] that the appellee, L. H. Polderman, in securing said lease from George Pepperdine Foundation paid a consideration which was partly based upon the net profits of the operation of Polderman, which consisted in the operation of the H.P.M. and Frick presses. The appellee, George Pepperdine Foundation, knew that the appellee, Polderman, and his copartners were operating the presses on the property at Niland and that they would use said apparatus. The appellee, George Pepperdine Foundation, and the individual appellees are therefore liable for the operation of the presses and subject to an injunction and an accounting if this court should find the claims in issue valid and infringed.

See:

Vrooman et al. v. Penhollow et al., 222 F. 894;

Findlay Mfg. Co. v. Hygrade Lighting Fixture Co.,
288 F. 957;

United Chromium, Inc., v. General Motors Corp.
et al., 11 F. S. 694.

The court's Finding 30 and Conclusion of Law 14 therefrom that the method and apparatus claims in issue were not infringed is not only not supported by the evidence but is contrary thereto and the appellees are liable for said infringement.

CONCLUSION.

Appellant submits that the trial court erred in finding that apparatus claims 4, 31, 32, 33, 34 and 36, and method claims 38 and 39 of patent 2,025,698 are invalid because of anticipation by prior structures and patents, because of the Martin prior use, for want of invention, for lack of novelty, for aggregation and for failure to comply with the provisions of 35 USC §33; and in finding that said claims in issue are not infringed. The court further erred in failing to find that said claims in issue are valid and are infringed by appellees' structures and method of operation. This court should accordingly direct the trial court to enter a decree finding said claims valid and infringed and providing for the issuance of an injunction and for an accounting.

Respectfully submitted,

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